

Chapter 1

INTRODUCTION

1.1 Livelihood of the majority of the population of the Jammu & Kashmir State revolves around the agriculture and allied sectors. These sectors constitute the mainstay of the State's economy and contribute nearly 50 per cent to GSDP. Over 70 per cent of the population, of more than 1.25 crores depends, directly or indirectly, on agriculture and its allied sectors. The diversification in the physiographic features and agro-climatic variation at macro- and micro-level, involving cold arid, temperate, intermediate and sub-tropical zones, within a small geographical area of 2.22 lakh sq. km indicates the inherent agricultural potential of the State. The net sown area (NSA) of 7.35 lakh ha (2009-10) is 35 per cent of the reported area as against the national average of 46 per cent. About 70 per cent of the net sown area is under the food crops. The average size of holding is very small (0.545 ha/holding) as compared to 1.66 ha at the national level with more than 93% of owners of these farm holdings subsisting on agriculture and allied activities.

1.2 Over the years, agriculturists and farmers have adopted several area- specific and time-specific cultivation practices to meet the requirement of their staple food crops. Rice, maize, wheat, pulses, fodder, oilseeds, potato and barley are the main crops of the State. There is currently a shift towards cultivating low-volume high-value cash crops, such as, flowers, vegetables, quality seeds, aromatic & medicinal plants, mushrooms etc. round the year. Honey, Bee-keeping, fodder intensification, production of quality saffron, 'Basmati' rice, 'Rajmash', off-season vegetables, potatoes etc. are also being cultivated in specific areas, belts and clusters depending upon the agro-climatic suitability.

1.3 Agriculture in the State faces several challenges that, primarily, include the following:-

- Agriculture in the hills and mountains of the State suffers from inherent constraints of remoteness and inaccessibility, marginality and fragility in terms of moisture stress and poor soil conditions and a short growing season. Added to this, are socio-economic constraints that, primarily, includes small land holdings, poor productivity, poor production management, labour shortages, poor

post-harvest management, poor market networks (lack of market development) and lack of entrepreneurship. All these factors have led to under utilization of available resource base leading to limited generation of surpluses.

- Arable lands are about 18% of the total geographical area, whereas the net sown area is only about 7%. More than half of the cultivable area is un- irrigated.
- Though area, production and productivity of different crops have increased over time, the rate of development has been very slow. The cropping intensity in Jammu region is reported to be 176%, whereas Kashmir and Ladakh regions closely follow with the levels of 123% and 106% respectively. In Kashmir and Ladakh regions, high cropping intensity is typically constrained by the incidence of moisture stress at the sowing time in October-November, inundation of fields in low lying areas after winter, harsh winters and short growing season.
- Hilly and inaccessible terrain in the State constrains the introduction of mechanized farming and hassle free transportation of inputs and products. Besides, being prone to soil erosion due to fragile soil, the hilly areas are also not amenable to multiple cropping, thus, impeding the uptick in the production and productivity in these areas.
- The spurt in the agricultural growth, in its wake, has brought about degradation of natural resources, particularly land, water and biodiversity. Erosion of genetic diversity has also resulted from the advent of HYVs in different crops. Many crops, which in this region enjoyed a niche, are no more in the production chain.
- Agriculture, overtime, has also become relatively less remunerative profession due to low yields, despite consistent accretion in the usage of a range of inputs, unfavourable price regime and low value addition.
- Capital inadequacy, lack of adequate infrastructural support and agriculture being carried out as a

subsistence option of livelihood have also influenced the economic viability of the agriculture sector resulting in new generation of farm youth shying away from agriculture and looking for urban centric vocations.

1.4 PRESENT SCENARIO:

- The State is blessed with varied agro-climatic zones, expressing in a wide variety of agricultural and horticultural produce, some of which are unique to the State. While Jammu region is home to high quality 'Basmati', 'Rajmash', Black Caraway ('zeera') etc., Kashmir region is rich in high quality Saffron, 'Zeera', fresh and dry temperate fruits and commercial floriculture. Ladakh region is endowed with high quality apricots and sea-buck-thorn berry etc. Enormous potential exists for bio-diversification due to varied agro-climatic and soil conditions.
- Food-grain production in the State has more than trebled, since the year 1950-51, when the production was 4.53 lakh MTs. Despite such significant strides, the state still imports about 40% and 20% of its requirements of food grains and vegetables, respectively. In the field of horticulture, the state has made phenomenal progress in the post-independence period. In the year 1953-54, area under fruit cultivation was just 12.4 thousand hectares with a production of only about 16 thousand MTs. At present, an area of 3.25 lakh hectares of land is under fruit cultivation and the fruit production has touched an all time high of 22 lakhs MTs. The State has 60% share in the production of apples in the country.
- At present, a little over 1 lakh tonnes of vegetables is imported into the State annually. It is, however, gratifying to note that imports of vegetables into the State have declined over the years despite a spike in the demand.
- In order to improve income of the farmers and generate employment opportunities as also to provide nutritious food to the consumers, off-season vegetable cultivation through protected cultivation under low cost green house technology and hybrid vegetable production in the open have been given a special thrust. The state has favourable flora and environment for sericulture. The soil and environmental conditions are conducive to the production of virus free quality seeds of flowers and vegetables. Commercial floriculture, cultivation of aromatic and medicinal plants, development of apiculture and mushrooms, on farm irrigation management and, above all, diversification to high value agriculture has shown substantial growth over the years.
- The livestock count of the State as per the last census has been estimated at 104.73 lakh as compared to 40.08 lakh in the year 1956. Livestock breeding is very important to the State's economy as this sector contributes roughly 13% to the State's GDP. The State has traditionally been deficit in the production of mutton, poultry and milk due to low productivity of local breeds. The situation has, however, started changing due to upgradation of local livestock through cross-breeding with high quality exotic breeds and implementation of various other schemes for provision of health cover, vaccination, fodder production etc. Most of the anti-poverty schemes mainly funded by the Government of J&K are livestock based.
- It is important to note that 56% upgradation of local cattle into cross-bred (jersey, Holstein, Friesian) has already been achieved. This has substantially increased the milk production, which is estimated at 18 lakh MTs (ending 2009-10). The per capita availability of milk in J&K is estimated at 330 ml, as against an average of 220 ml at national level and the level of 285 ml recommended by the ICMR and the WHO. Besides, 58.5% upgradation of the local sheep into genetically improved cross-bred sheep has already been achieved in the State. This has improved the availability of wool and mutton in the State.
- Nature has bestowed the State with rich floral resources required for production of quality honey conforming to international standards. Apiculture, which was on a high growth path until 1986 was, unfortunately, hit by an epidemic of sac brood disease. This had a debilitating effect on the sector. With the introduction of exotic bee *Apis mellifera*, the industry is on the

way to recovery. This sector offers tremendous potential for creating employment opportunities for rural youth, in particular, and income to the rural folk, in general.

- The State has the unique distinction of producing the highly valued bivoltine cocoons. Despite the monopoly on the trade until recently, the state had to surrender its primacy in sericulture to the north-western states. However, today it ranks first in cocoon production amongst these states because of proactive R&D interventions. The state produces around 900 MTs cocoon annually. Around 3100 hectares of land are reportedly under cultivation of mulberry trees.
- There is a tremendous market, both for fresh and canned mushrooms because of their cholesterol-free nature, low calorific value, and high protein content. The demand is on the rise. The climate of the state is highly conducive for the production of mushrooms and, therefore, this activity offers significant potential.
- Pisciculture has emerged as a profitable and employment generating activity in the farming sector of the State. The fish production has increased more than fourfold, from 4277 MTs in 1956 to 19.3 thousand MTs in 2009-10.
- Cooperatives have played a very important role in the economic and social profile of the state after independence. There are 1393 cooperative societies in the State with a total membership of 6.02 lakhs. The turmoil during the last two decades or

so has adversely affected the functioning of the cooperative institutions. The management of these institutions has been taken over by the Government authorities from time to time, thus, negating their democratic character. Despite all odds, elections to most of these cooperative institutions have been held in the recent past and the institutions are likely to become vibrant once again.

- With the exception of the J&K Bank Ltd., the credit deposit ratio in the case of the commercial banks as well as cooperative banks in the State is extremely low. In particular, the flow of credit to the agriculture and allied sectors is dismal. As opposed to the national benchmark of 18%, the credit exposure to the agriculture and allied sectors is estimated at 14%.
- Despite significant strides made so far in harnessing potential benefits for the farming community, the sustainable growth in the agriculture sector cannot be realized unless the systemic problems are appropriately identified, effectively tackled and successfully overcome. The development strategies, geared towards overcoming the constraints imposed by the mountain agriculture, together with formulation of farmer responsive plans, are absolutely essential for long term growth of agriculture across all geographies in the State.

Chapter 2

POLICY FRAMEWORK FOR FUTURE AGRICULTURE DEVELOPMENT

2.1 Agriculture development in the state would be guided in future not only by the objective of attaining food and nutritional security, but also by the concerns of declining profitability, environmental degradation and ecological unsustainability. Therefore, agriculture based development strategies should rely on increase in profitability, especially of the small and marginal farmers, together with creation of employment opportunities for rural youth, both in farm and non-farm sector. The share of high value agriculture in the agriculture is increasing steadily and this segment of agriculture is perishable in nature and, therefore, requires a very different approach than has been the case in food grains.

2.2 The State Agriculture Policy is, therefore, aimed at developing a road map that will seek to actualize the vast untapped growth potential of the agriculture, promote value addition, accelerate the growth of agri-business, create employment in rural areas, secure fair standard of living for the farmers and agricultural workers and their families, discourage migration to urban areas and face the challenges arising out of economic liberalization, globalization and climate change. The policy framework will broadly aim to achieve the following

- Growth rate of about 4% per annum.
- Prevent conversion of agricultural land for non-agricultural use. To achieve the objective, strict laws have been promulgated involving punitive action for any violation, particularly in respect of more productive lands (*Abi-awal* etc.).
- Promote sustainable use of natural resources and adoption of practices that conserve soil, water and biodiversity. This will also involve transition of hilly regions to "Organic Farming". Efforts will be made to combine the tradition and innovation, so that future generations will have a fertile soil and clean drinking water.
- Promote closer cooperation and interaction between government agencies, research institutions and farmers to attain growth in agricultural productivity and income based on local conditions.

- Foster an efficient mechanism of assessment, delivery and control for providing timely and quality inputs to the farmers as per optimum requirement.
- Promote diversification to crops and such other agricultural activities that are commercially more viable for increasing farmers' income as per local agro-climatic and market conditions. The Government will devise measures to promote agriculture that enable it to fulfil its multifarious tasks.
- Adopt and implement plans for growth in productivity and income based on specific geographical, agro-climatic and traditional practices within different agro-climatic zones.
- Promote dry land technologies and adopt specific water conservation initiatives like watershed development etc., to raise farm production and income in rain fed ecosystems of the State.
- Promote value addition, agri-business and market initiatives to secure higher incomes for agricultural produce.
- Foster interface between farmers and the banks and insurance companies as also with other concerned agencies to secure farm credit facilities and crop insurance for the farmers.
- Promote growth that is technologically sound, economically profitable and environmentally sustainable, so that the agriculture in the state develops in a socially acceptable way.

2.3 STRATEGIC PLANNING

The strategic policy objectives shall be realised/achieved through the following specific interventions:-

- i) Research/Farmers' Interface:
- The research and extension linkages will be strengthened to improve quality and effectiveness of research and extension system, and harness high cropping intensities. Increase in cropping intensity will be achieved from the present level of 123% to 150% in Kashmir, 176% to 190% in Jammu and 105% to 120% in Ladakh region.
 - Integrated package of measures will be implemented to increase farm productivity and profitability without any ecological harm; harnessing available technological opportunities both for

irrigated and dry land areas. Greater congruence between productivity and sustainability will be ensured through integrated soil-water-nutrient management to bridge the existing yield gaps.

- HRD programmes for farmers as well as resource persons will be given renewed thrust for knowledge, skill and technology upgradation and adoption. Specific human resource and skill development programmes will be pursued to help them make better/informed decisions/choices.
- There is a need to strengthen adaptive research, technology assessment and refinement and transfer capabilities of the state so that existing wide technology transfer gaps are bridged. Thrust will be given to transfer of technology (ToT) programmes. This will be carried out through the training schools for the beneficiaries, modern tools of communication (Internet, FM, Mobiles etc.), National Animal Disease Reporting System (NADRS) and other available avenues of modern ICT.
- Efforts shall be made to give fillip to varietal research and plant breeding and 'Protection of Plant Varieties and Farmers Rights' to stimulate investment and initiative both in public and private sector for development of new plant varieties that require less inputs. However, at present only the most productive varieties of crops are grown due to economic pressure that leads to a drop in genetic diversity of native crops and cultivated plants. Endeavour in the new policy of the government will be to protect rare older varieties and with them the local knowledge and corresponding traditions.
- Quality seed of high yielding crop varieties is the primary factor for increasing productivity. Seeds of high yielding and better quality varieties and hybrids, recommended for the region, will be popularized and adequate quantities multiplied through the efficient seed production mechanism including micro-propagation technologies (tissue culture), especially, in potato, saffron, 'kala zeera', strawberry, ginger etc. where protocols have either been developed or are in the process of development. Seed Replacement Rate (SRR) of the cultivated crops will be enhanced from current level of 8-10 per cent to 25% in self-pollinated crops, 33% for cross-pollinated crops and 100% in case of hybrids. A Perspective Plan to achieve

these seed targets will be developed and private sector participation encouraged to produce the quality seed.

- Prosecution of agricultural research at State Agriculture Universities based on identified agro-climatic zones will be accorded high priority. Application of frontier sciences like biotechnology, remote sensing technologies, pre- and post-harvest technologies, energy saving technologies, technology for environmental protection to face the consequences of climate change on production systems will be encouraged to harness the tangible benefits for the farmers and stakeholders.

ii) Resource Management for Sustainable Agriculture:

- For moisture stress areas, water conservation/harvesting infrastructure and for low lying areas, drainages shall be created to increase the area under double cropping. Food self-sufficiency will be achieved to a considerable extent together with adequate availability of fodder by double cropping under Rice-Wheat rotation in the valley. For this seed production of recently released short duration wheat variety (Shalimar Wheat-1) will be promoted.
- Special attention will be paid to rainfed farming (dry land agriculture) in terms of augmentation of available water resource, rain water harvesting and recharge of aquifers. Judicious use of irrigation water is necessary and management will be ensured through improved irrigation practices, micro-irrigation systems (sprinkler and drip irrigation), water harvesting structures, cultivation of high value low water requiring crops, water saving methods of cultivation to improve Water Use Efficiency (WUE) e.g. System of Rice Intensification (SRI) and choice of cropping pattern.
- In the hilly regions of the State, particularly Kashmir valley and intermediate hilly zone of Jammu region "Organic Farming" will be promoted through conjunctive use of plant residues, farmyard manure, biofertilizers, vermicompost, biopesticides, biocontrol agents, associated cropping of legumes with cereals etc. This will improve Total Factor Productivity (TFP) and sustainability of farming systems. Certification mechanisms will be created for marketing of the organic produce to harness remunerative prices for the growers.
- In the areas of the state, where organic farming may not be feasible, Integrated

Nutrient Management will be encouraged using available organic resources with inorganic fertilizers. However, nutrient application to soils will be based on soil test results and therefore, soil health cards will be made available to all the farmers. Mobile soil testing laboratories will be made available in all the districts for this purpose.

- Protected agriculture in the hilly areas of the state will be given priority using low cost polyhouse technologies, particularly, for growing vegetables, commercial floriculture, cash crops (strawberry), nursery raising, quality planting materials etc.
- Off-season vegetable production to ensure prolonged availability for domestic consumption and export using varieties released and adopted by SAUs with prescribed package of practice will be promoted. Hybrid seeds developed by the Universities as well as other public/ private seed agencies will be adopted after proper testing. Cold storage facilities will be strengthened and development of cold chains for marketing vegetable surpluses will be given due attention. Vegetable seed production has good prospects and will be promoted.
- Conservation agriculture will be promoted in time and scale to conserve natural resources and prevent their degradation using Resource Conservation Technologies (RCTs) like zero tillage, proper crop rotation, residue management etc. This will result in optimising farm returns on a sustainable basis.
- Insulation of our production systems to face the consequences of climate change will be given priority. Mitigation options for sustainable agriculture will be developed through appropriate interventions. For agro-meteorological interventions, weather stations will be established in all the districts of the State through ISRO.
- Indiscriminate use of pesticides is usually followed to prevent losses in production and sometimes these pesticides are usually non-specific and result in environment pollution, human health hazards and emergence of resistant forms of target species. Integrated pest management approach based on synergistic use of resistant varieties, appropriate cultural practices, bio-pesticides, bio-control agents and disease management will be the key

components for sustaining food production and productivity together with ensuring eco friendly environment. Disease surveillance, in the context of emerging threats of climate change, will be given due attention.

- Rejuvenation of pastures and meadows to upgrade their biomass potential to ensure availability of fodder for livestock husbandry is urgently required. In addition the watershed development will be linked to production of fodder, agro-forestry species (of fodder value) to augment the nutrient requirement for the livestock in the state. Besides, to utilise the crop residues as livestock feed, Feed Block Technology together with bio-fortification of less nutritive fodder will be promoted on a larger scale. Area under fodder production, currently at about 4%, will be increased to 12%. Besides, a Grazing Policy for the state will also be formulated.
- In the cold arid region of Ladakh, the cost benefit framework on investments is not favourable, both for horizontal and vertical improvement of crops and livestock husbandry. Irrigation is the major constraint and its concurrent availability, through irrigation projects, will be augmented, as it will considerably optimise benefits from other inputs. Use of organic manure and inorganic formulations in a balanced manner will be promoted to ensure sustainability of the biological productivity of soils in the region. Vegetable production together with production of quality seed will be promoted. Minor crops like foxtail millet, buckwheat etc. essential for food and nutritional security will be promoted.

iii) Strengthening Input Supply:

- Inputs required for sustainable agricultural growth like biofertilizer production, vermicompost units, farm machinery and equipments etc. fabrication in private sector will receive high priority.
- Reliable and timely availability of quality inputs at reasonable prices, institutional and credit support, especially for small and marginal farmers and support to land and water resource development will be the priority of the government. Particular attention to the needs and participation of the women farmers will be given. Mechanism for distribution of inputs (seed, fertilizers,

etc.) will be streamlined. Within five years, all farmers in this state will have Kissan credit cards. In the first year itself, such cards will be made available to at least one block in each district. Preference for granting license for trade in input will be given to cooperatives/self-employment ventures set up by agricultural graduates.

- Establishment of Seed Banks will be promoted to meet contingent requirements of seed in the wake of natural calamities. Attention will be given to create community fodder banks in Ladakh to overcome endemic shortage of fodder in the region.
- The Government will provide active support for the promotion of cooperative form of enterprise. In this regard, institutional reforms will be pursued so as to channelise their energies for achieving greater productivity and production.

iv) Development of Homogeneous Groups/Clusters:

- A regionally differentiated strategy will be pursued, taking into account the agronomic, climatic and environmental conditions to realize the full growth potential of every region. Special attention will be given to identification and development of new crop varieties, particularly of food crops, with higher nutritional value as well as resistance to biotic and abiotic stresses to effect vertical improvement in productivity.
- Agriculture will be developed on agro-climatic and agri-eco basis and strictly based on appropriate strategies for irrigated and rainfed/dry land areas. In cultivable wastelands, medicinal and aromatic plant propagation will be promoted on a large scale.
- In irrigated areas, full production recommendations with emphasis on latest improved HYVs/hybrids, macro and micro-nutrient application as per scale, plant protection measures and adoption of farm- mechanization techniques will be pursued.
- In un-irrigated/dry land areas, Integrated Watershed development approach and Farming System approach with emphasis on adoption

of dry land technologies and improved production of crops like cereals, oilseeds, pulses, coarse cereals, fodders etc. shall be promoted to help resource poor farmers. In cultivable wastelands, medicinal and aromatic plant cultivation will be promoted on large scale.

- Clusters, belts and hubs will be developed for specific agricultural products like potato, vegetables, 'rajmash', 'basmati' rice, organic products, spices, condiments, saffron, mushrooms, honey, etc.
- Farmers working in clusters, belts and hubs will be given incentives.
- The database for the agriculture and allied sectors will be strengthened to ensure greater reliability of estimates and forecasting which will help in the process of planning and policy making.
- Public-Private Partnership for investment and growth in agriculture shall be an essential ingredient of all development strategies for holistic development of the agriculture and allied sectors. SHGs, Societies, NGOs, Charitable Organizations etc. will be encouraged to be partners in this development strategy.
- The Centrally Sponsored and Central Sector Schemes like RKVY, ATMA, Macro Management Scheme, etc., which follow work-plan approach based on crop/area specific, regionally differentiated strategies, to ensure timely and effective application of limited financial resources shall continue to be implemented in the State to accelerate the pace of developmental activity and implement the strategic objectives of the agriculture policy. Similarly, Horticulture Mission for the North-East & Himalayan States (HMNH), earlier named TMNE, shall continue to be implemented in the state as per guidelines of the Scheme.

v) Post Harvest Technology and Marketing:

- Emphasis will be laid on development of marketing infrastructure and techniques of preservation, storage and transportation with a view to reduce post-harvest losses and ensure a better return to the grower. 'Mandis' will be established at the lock level.
- Setting up of agro-processing units in the producing areas to reduce

wastage, increased value addition and creation of off-farm employment in rural areas will be encouraged.

- The price structure and trade mechanism will be continuously reviewed to ensure a favourable economic environment for the agriculture sector and to bring about an equitable balance between the rural and the urban incomes.
- Quality consciousness amongst farmers and agroprocessors will be created. Grading and standardization of agricultural products will be promoted for promotion of export.
- Application of science and technology in agriculture will be promoted through a regular system of interface between science and technology institutions and the users/potential users to make the sector globally competitive.
- Establishment of rural godowns, both for storage of grains as well as seeds, will be promoted.
- A mechanism will be essentially put in place for utilisation/ augmentation of production-post-harvest management- marketing to ensure minimum spoilage and maximum remuneration to farmers.
- Use of Information and Communication Technology (ICT) will be promoted as a mechanism for market intelligence/ information on sale of produce etc.
- Promotion of food processing industries and value addition in agriculture through the excise exemptions and other interventions shall be considered in consultation with the Finance Department.

vi) Increasing Profitability from Farm Enterprise:

- The Government will promote contract farming as symbiotic contracts confer benefits to both producers and purchasers in terms of ensuring assured and remunerative marketing opportunities. Contract cultivation based on a well defined code of conduct will be helpful to small farmers in getting good quality input, a fair price as well as prompt payment for their produce. Contract farming consistent with the legal framework of the State, will be explored in vegetables, flowers, medicinal and aromatic plants, saffron, kala zeera, aromatic rice,

seed production of high value-low volume crops etc.

- Reluctance of educated rural youth towards practising farming demands appropriate mechanization of agriculture aimed at removing drudgery and improving profitability. Since small and marginal farmers dominate, mechanization needs will be met through network of agro-service centres.
- Priority will be given to provide a package insurance policy for the farmers, right from sowing of the crops to the post-harvest operations, including market fluctuations, in the prices of agricultural produce.
- Adoption of Seed Crop Insurance Scheme shall be explored to provide for risk coverage in seed production.

2.4 OTHER SPECIFIC THRUST AREAS:

- i) Vegetable Production
- ii) Basmati Rice Production
- iii) Saffron Production.
- iv) Mushroom Development
- v) Apiculture Development
- vi) Good management Practices
- vii) Quality Control Management

i) Vegetable Production:

Vegetable cultivation in Kashmir division is a commercial farming practice. Vegetable production has been trending up, since 2003-04, due to introduction of Technology Mission (HMNEH). During the peak season i.e. March-October, vegetable export to Jammu and other states has crossed about 2.00 lac Mts. The cultivation of new all-season hybrid vegetable varieties under protected cultivation has played a vital role in increasing the vegetable production in the division. The department of Agriculture shall boost the seed production of, both open pollinated and hybrid vegetable crops, besides foraying in post-harvest processing of fresh vegetables to create employment opportunities for the unemployed educated youth in the valley. In addition, zonalisation, as a widely accepted tool of preserving the niche status of vegetables, will be given due priority in pursuing vegetable seed production programmes. In Jammu region, cultivation of hybrid, exotic and indigenous kinds of vegetables in different agro-climatic zones round the year and large scale use of protected cultivation techniques has augmented the vegetable supplies. Exports of hill peas, potato and other high value vegetables during *Kharif* season to the plains is the new focus of Agriculture Department

Jammu. Formation of Farmers Producers' Organizations is being stressed to facilitate end to end linkages for marketing, post-harvest management and remunerative returns to farmers.

ii) *Basmati* Rice Production:

In order to give a boost to *Basmati* cultivation, the State Government has been able to get the restrictions on the export of *Basmati* Rice/Paddy outside the State lifted.

Farmers are being made conversant with the standards of quality *Basmati* rice production and protection techniques. Provision of quality Certified and foundation seeds, organizing Farmers' Field Schools, awareness campaigns through trainings, seminars and Buyer-Seller meets, pest and disease control measures in the identified clusters in the potential belts has been made a thrust area. Area under *Basmati* rice cultivation shall be increased from the existing level of about 35000 hec to about 66000 hec in the next five years alongwith an increase in the production level from about 88 thousands MTs to 3.33 lac MTs.

iii) Saffron Production:

Saffron production in the state has historical background and J&K is the only state in India to produce Saffron for commercial purposes. Saffron production has decreased during the past two decades due to the global climatic changes. Now, the crop has been covered under the project for economic revival of J & K Saffron sector (National Saffron Mission) by the Government of India. The productivity of Saffron in traditional areas is expected to increase up to 5.00 kg per hectare from the present level of 2.5 kg. per hectare by rejuvenation of traditional saffron areas. The rejuvenation of the traditional saffron areas shall be executed through adoption of modern production technology, creation of micro irrigation facilities by way of establishment of bore-wells, sprinkle irrigation systems, INP, IPM, IDM, post harvesting management and market intervention system, besides by the establishment of saffron corm multiplication nurseries in public sector and strengthening of quality control management system.

iv) Mushroom Culture:

Although some strides have been made in this field, the absence of required infrastructure facilities for production of

spawn and other facilities has not allowed the full utilization of the potential so far. Major thrust will be given to development and import, if necessary, of high yielding strains of mushroom and setting up of spawn producing laboratories fitted with modern equipment. Mushroom producers will be encouraged and supported for procurement of sophisticated environment control system and pasteurization facilities for increasing productivity in mushroom production. Cost effective technology using, as far as possible, locally available materials will be promoted for the establishment of facilities for cultivation of mushrooms.

v) Apiculture Development:

Well-equipped bee-breeding centers will be set up in appropriate ecological locations where pertinent bee species can be maintained, multiplied and distributed to private sector. Bee keeping equipments like bee queen entrance guards, queen excluders, honey extractors, and hive tools of standard quality will be supplied to bee keepers from departmental agencies as well as through agri-service centers to be set up in the private sector. Honey testing laboratories will be set up in both the divisions to ensure quality of honey. Bee keeping laboratories will be set up in both the divisions to ensure quality of honey. Bee keepers will be encouraged and supported in setting up facilities for storing, processing, grading and packing of honey on scientific lines and improving marketing efficiency.

vi) Good Management Practices:

- Stress shall be laid on quality at all stages of farm operations from sowing to primary processing. Quality consciousness among farmers and agro-processors will be promoted through effective use of the media and personal contact by the departmental functionaries and instituting a scheme of awards for recognizing outstanding performance.
- Integrated Nutrient Management practices using chemical fertilizers in conjunction with organic resources like farm-yard manure, enriched compost bio-fertilizers and green manuring will be popularized. This will optimize crop production in irrigated as well as rain-fed areas, besides improving soil productivity. Infrastructure of Stationary and Mobile Soil Testing Laboratories shall be expanded and strengthened to extend the reach of these facilities in the hitherto unreached areas.
- Integrated Pest Management package will be popularized for adoption through

special incentives. This would check the indiscriminate use of chemical pesticides and out-break of secondary pests, pollution in food materials and ecosystem and add a new dimension of organic production for promoting marketing of fruits and vegetables. Mobile Plant Health Clinics are the new interventions made by the Government. These will augment the requisite infrastructure for providing plant disease and pest diagnostic services and enable effective preventive measures against pests.

- Farmers will also be educated about the concept of integrated development of their farm households by taking a holistic view of assets and potential. For this purpose, convergence of various schemes for development of the rural sector will be a priority.

vii) Quality Control:

- Strict quality control will be observed on supply of plant material and agriculture

inputs. A separate enforcement agency will be set up for ensuring implementation of various laws relating to the agriculture sector. Sale of non-descript planting material shall be banned.

- Fully equipped quality control laboratories for soil testing, leaf analysis for micro nutrients and testing for pesticide residues in fruits, vegetables and other crops will be set up at various locations in the State and existing laboratories will be strengthened. Mobile testing facilities will also be set up for soil testing in order to ensure balanced use of nutrients.
- Strict quarantine measures/regulations will be adopted while importing any plant material.

viii) Rainfed Area Development:

The Department of Agriculture envisages taking up the development of rainfed areas as a thrust activity as more than 74 percent of the cultivated areas of Jammu region and more than 40 percent of the cultivated area of Kashmir region are rain fed. Popularization of stress tolerant varieties, micro-irrigation systems, and dry land farming techniques on watershed development basis shall be given a renewed thrust.

Chapter 3

POLICY FRAMEWORK ON HORTICULTURE

3.1 The State of Jammu and Kashmir is endowed with wide agro-climatic conditions, which are conducive for growing different types of fruit crops. Ranging from the sub-tropical climate zones of Jammu region to the arid zone of Ladakh, to the temperate region of the Kashmir Valley, the State offers tremendous potential for horticulture sector. A continuous growth in this sector has been observed since the last 50 years. From an area of about 0.16 lac hectares under fruit crops during the year 1960 the present area under fruit crops has reached a level of 3.25 lac hectares. Similarly in respect of production, the state has touched a production of over 22 lac metric tones during 2010-11 whereas the production during 1960 was just about 33000 M.T. Presently, the state ranks first in the country in respect of production of temperate fruit crops. Such a significant progress in this sector can be attributed to multiple factors, which, among others, include plantation of new cultivars, introduction of high density varieties, better orchard management, adoption of better cultural and production techniques etc. In the horticulture sector, temperate fruits grown in the Kashmir Valley are the major contributors to the state's horticultural income. Apple alone contributes about 85% of our total fruit production. The state has huge potential to achieve substantial increase in the production of other fruits like walnuts and almonds. High value horticultural crops, which are now being tried in the state, could revolutionize this sector. The adoption of new technologies and appropriate infrastructures will play a key role in achieving higher production and productivity. Appropriate use of micro climatic conditions can be exploited for the advantage of the farmers. The horticulture component of the policy shall have the following elements:

3.2 ZONALISATION: Different horticultural crops would grow best in certain micro environmental conditions. It is observed that presently plantation of different horticultural crops is adopted randomly without following concepts of zonalisation. There could be areas/pockets, which could be more appropriate for certain crops or for certain purposes and there could be certain areas that may not be very

conducive for fruit bearing of temperate crops, but could be more appropriate for vegetative growth and, as such, these areas could be better suited for raising nurseries of the temperate fruits. Similarly, areas with different chilling periods could be segregated/classified thus enabling to plant suitable varieties which could thrive better in such areas. In order to classify the entire state into different micro climatic zones, a joint team of experts from SKUAST (J/K) and Department of Horticulture (J/K) will be constituted, who would complete the classification within a period of one year from the date of notification of the policy. These classified zones will be publicized for horticultural activities and defined for appropriate fruit crops. Besides giving a wide publicity through electronic and print media, small booklets in Urdu will be widely circulated through respective horticultural offices in the state so that the concept of zonalisation reaches the farmers.

3.3 NURSERY RAISING: Disease free and quality plantation is a basic need for healthy orchards. In order to ensure availability of quality plant material, enforcement of Nursery Registration Act is a basic need. It is to be made compulsory for the department of Horticulture to ensure raising of quality plant material, both in public as well as private sector. Each nursery of the department needs to be accredited by the national level accreditation agency. Similarly, in private sector, accreditation of the nurseries through the national level organization will be made mandatory. Selling of fruit plants other than from such nurseries or selling of plants on the road sides will be strictly banned. Each nursery in the public sector shall be headed by a Horticulture Development Officer, and he will be also responsible to monitor raising of the plant material in the private sector nurseries. Nurseries in the public sector shall be provided with required necessary infrastructure. Similarly, nurseries in the private sector shall be also provided required financial assistance under different ongoing schemes. The department will also provide expert assistance to the private sector nursery growers. Both the private sector and public sector nurseries must focus raising of such plants which will be required in their respective areas/in the state. Raising of

plants by tissue culture has to be a focus both in public as well as private sector. Mass multiplication of plants by latest technologies, developing/ establishing protocols for different kinds of plants/ rootstocks by the technique of tissue culture shall be thrust areas of this policy. Establishment of bud banks as a part of the nurseries in each district will be given due thrust. Bud banks of required cultivars/kinds need to be established with duly established pedigree records in all the districts.

3.4 IDENTIFICATION & MULTIPLICATION OF UN-EXPLORED SPECIES/ VARIETIES:

It has been observed that the state is a rich reservoir of un-explored fruit crops including berries. Further, there are certain un-identified cultivars of some fruits growing in the state. The responsibility of identifying/isolating, multiplying, evaluating these varieties shall be entrusted jointly to a team of experts of SKUAST and department of Horticulture. Once identified and evaluated, the process of their multiplication and popularization for commercial cultivation will be taken up by the Horticulture Department.

Steps will be taken to revive different varieties of fruits which are becoming/ or have become extinct. Besides, efforts will also be made to identify germ plasm with good quality attributes and the same will be multiplied to ensure better commercial returns.

3.5 MEDICINAL AND AROMATIC PLANTS:

While focusing on popularization/ cultivation of aromatic and medicinal plants, due care will be taken to create infrastructure for post harvest handling, processing, preliminary processing of various aromatic and medicinal plants. Infrastructure for raising germ plasm of such plants and their multiplication, either as such or as intercropping, in the orchard areas will be a priority. Multiplication through tissue culture to raise quality planting material in important medicinal plants will be explored.

3.6 INTER-CROPPING IN ORCHARDS:

In order to maximize the returns per unit area of land/orchard holdings, massive awareness will be created for popularizing the cultivation of leguminous crops, vegetables, flowers, aromatic and medicinal plants in the orchards. This will help to boost the income as well as enrich the soil health. Horti-pestoral systems to augment

the requirement of fodder for the livestock will be given due thrust.

3.7 INTRODUCTION OF NEW SPECIES/VARIETIES

Keeping global scenario in respect of international marketing in view, the state needs to introduce certain new varieties/species of fruit plants, which could be grown successfully in the state in view of agro-climatic conditions. It would be appropriate to arrange import of such species, kinds/cultivars/varieties from different sources and get them evaluated under agro-climatic conditions of J&K State, before releasing them for commercial cultivation in private fields. This is essential to keep pace with the global markets. While importing varieties/species of different kinds, due consideration shall be given to the agro-climatic conditions, productivity, market demand, quarantine regulations and other relevant parameters. The varieties, which functions as pollinators shall be incorporated so that proper balance in respect of pollination is maintained.

3.8 MECHANIZATION:

Mechanization and use of modern gadgets/machines/equipments for timely completion of different operations in horticulture sector is one of the most important factors for maximizing profitability. It is observed that most of the operations like weeding, hoeing, pruning, picking, grading, spraying etc. do not get completed within the prescribed period, as most of these operations are performed manually. Besides, being time consuming, the manual operations are sometimes faulty and deviate from the levels of precision. In view of this background, there is need to popularize such gadgets/machines/equipments, which can perform the operations with much better accuracy and at faster rate. Moreover, for such operations for which the required machines/tools are not available or the available tools/machines do not suit the local requirements, new appropriate tools/gadgets/machines shall be developed and then popularised in the relevant areas. Smaller machines suitable for horticultural operations in the hills and mountains will be introduced for testing and adoption.

3.9 POPULARISING HIGH DENSITY PLANTATION:

This is an established fact that higher levels of production can be achieved by establishing orchards of high density plantation. This has now been even commercially tried and tested in private sector orchards in Kashmir Division as well. It

will be one of the major endeavour to cover new areas under high density plantation. However, the appropriate rootstock suiting to the rainfed and irrigated areas will be given due consideration while adopting high density plantation. The high density plantation of horticulture crops like apple, cherry, pear, Walnut etc. will be taken under area expansion programmes wherever suitability of such plantation exists. Suitable varieties for these crops will be introduced/developed by the State Agricultural Universities.

3.10 REJUVENATION:

Rejuvenation/revival of such orchards which have completed their bearing capacity will be taken up at much larger scale. This will include top working or re-plantation with appropriate varieties. Wherever possible high density plantation will be used for revival of these old and senile orchards.

3.11 CREATION OF IRRIGATION INFRASTRUCTURES & CONSERVATION OF MOISTURE:

Nearly 70% of orchard area is rainfed. Quality and productivity are directly influenced by proper irrigation. The water scarcity in the orchards leads to shrivelled fruit production, which influences the over-all quality, production and productivity. A strategy is required to address this problem. Following infrastructure will be strengthened/developed:

- Strengthening/modernizing the existing canals/khuls/lift irrigation schemes, with adequate arrangements of its distribution system to the orchard areas. Wherever old local khuls have been neglected or they have turned defunct, priority will be given to revive them.
- Creation of new canals/khuls: Wherever possible new khuls/canals/lift stations to cater to the needs of orchard areas will be taken up in a phased manner.
- Construction of check-dams and mini water lifting stations: In many of the kandi/karewa areas water through nallah's flows for a reasonable period of year, but due to local topography of orchard areas, this water is not being used for irrigation purposes. Having regard to the local availability of water in the nallahs, small check dams and mini lift stations will be set up as per the suitability of the area. Further, the distribution system in the orchard areas will be laid properly to ensure proper irrigation. The irrigation water will be

promoted for use through micro-irrigation systems to increase water use efficiency.

- Construction of mega water harvesting and water storage tanks: In most of the areas especially on the foot hills, reasonable number of springs exist. Generally, the water of these springs flows down to the rivers without being used for irrigation purposes. For a substantial period of the year, the agricultural crops do not require irrigation. If this water is stored, the same can be used in subsequent months for irrigation/critical irrigations. Similarly, mega storage tanks for harvesting rain water will be constructed for orchard areas, wherever possible.
- Deep bore wells: Deep bore wells in different orchard areas will be set up to irrigate the orchard areas. Though, as per provisions of existing Centrally Sponsored Scheme, assistance is being provided to individual/group of farmers for installation of such bore wells, the State will establish infrastructure at a much higher scale.

3.12 MICRO IRRIGATION:

Micro irrigation will be a focus in orchard areas as well in other crops. Wherever feasible, sprinkler/drip irrigation will be used for horticulture as well as agriculture crops.

Conservation of moisture by use of appropriate mulching techniques will be focused especially in rainfed orchards.

3.13 ORGANIC FARMING:

Since organic farming is gaining momentum throughout the world, emphasis will be laid on raising fruit crops under organic farming. Some of our horticultural crops like walnut, almond and apricot (from Ladakh region) are generally grown without application of any fertilizers/pesticides and, as such, are organic in nature. But due to lack of proper certification, these commodities are not being branded as organic produce. Due care will be taken to arrange certification of such produce.

3.14 WALNUT FOR TIMBER PURPOSE:

Walnut, which is one of the important dry fruits of the state, is at times victim of the greedy traders, who use the timber of the walnut for making furniture. Appropriate species of walnut suited, to furniture making, will be introduced and multiplied in the specific areas, so that the walnut fruit

bearing trees are saved from exploitation/utilization for making furniture.

3.15 LANDS BELOW FOREST LINE:

Vegetative cover below the forest land will be appropriately considered to be brought under plantation, which will not only help to improve the eco-system, but will also generate income opportunities for the people living in these areas. Steps will be taken to develop community based orchards for appropriate fruit crops like walnut, persimmon, pomegranate, quince etc.

3.16 CREATING AWARENESS AND TRANSFER OF TECHNOLOGY:

Inclusion of horticulture as a subject in pre-matric/post-matric syllabus will be recommended to the concerned authorities of School Education Department, so as to create awareness in the young generation as well as eventual development of basic human resource.

Mass education about the basic concepts of orchard raising, which include training, pruning, promotion of pollination, concept of fruit thinning, scion stock relationship, use of polinizers (including honey bees) etc. will be taken at a massive level through one to one contact, print and electronic media and all other possible means of creating awareness. Practical training/demonstration for such component will be held to upgrade the skill of various stakeholders.

SKUAST-Kashmir/Jammu will be approached for special training capsules to overcome lack of proficiency in important horticultural operations like training/pruning etc.

3.17 CROP INSURANCE:

Coverage of horticultural crops under appropriate insurance schemes will be taken up by the Government. Appropriate steps will be taken to cover marginal/small farmers/growers, who are interested to cover their orchards/fruit crops under insurance. The arrangement will be put in place in such a manner that the interested growers have to pay a nominal premium while a significant part of the premium flows from the State/Central Government. This will ensure appropriate financial handholding for the growers during natural calamities.

3.18 CREATION OF INFRASTRUCTURE:

Emphasis will be given to set up various infrastructure facilities, which will directly or indirectly promote the horticulture sector. Some of the infrastructure will be of the following types:

- Quality control/testing laboratories for testing of pesticides/fungicides/fertilizers and other horticulture/agriculture inputs will be strengthened/established in all the districts. Private/public partnership will also be promoted for creating of such infrastructure.
- Weather/Disease forecasting units will be set up to provide timely information to the growers so that appropriate preventive/remedial measures for diseases/pest control are taken by the growers.
- Low cost storage chambers will be popularized/set up.
- All possible support for setting agri-clinics will be provided to the technocrats especially in rural areas.
- In order to facilitate better marketing tie-ups, internet/cyber facilities exclusively for growers will be set up in fruit growing areas.
- Laboratories for testing seed/plant material etc. will be set up at the district levels.
- Mobile soil testing laboratories will be set up in each district.
- Soil health cards will be provided to all the farmers so as to know their soil status. This will help to use appropriate macro and micro nutrients in their fields.
- Development of human resource in public as well as private sector will be a priority. Officers/officials from the departments, research institutions/universities, will be kept apprised of the latest technologies by conducting short term workshops, training programmes and by deputing them within and outside the State/country for practical training. Such like programmes for human resource development will also be taken in the private sector where farmers will be trained in different technologies and their knowledge/skill will be upgraded if required. They will also be imparted training outside the state/country. Short-term tours/visits will be made more frequent both for officers/officials and growers, so as to create awareness about latest technologies.
- Technical experts from different institutes/universities/organizations who have a rich practical knowledge/experience in their respective fields will be hired for imparting necessary

training to the farmers/officials in different sectors of horticulture.

- The research institutions will be advised to focus on working out strategies, which will help in reduction of input costs and maximize output from horticultural crops.
- Provision for cooperative/contract farming will be worked out, so that while protecting the interests of land owners, the production/productivity is increased and more and more land is brought under plantation/cultivation.
- Public/private partnership will be encouraged for raising horticultural crops, horticulture related inputs and infrastructure.
- The potential for tourism will be tapped in the horticulture sector, by setting up model orchards in certain areas for tourist attraction. While boosting the horticulture and equipping the horticulture farms/fields with latest technologies, the areas will be made attractive that can be demarcated as horticulture tourism spots/villages.

3.19 FARM SCHOOLS/INSTITUTIONS:

Farm schools/Institutions will be set up for providing short-term diploma/certificate courses in horticulture sector. The focus of these training programmes will be to educate youth, both educated and illiterate, in different components of fruit plant cultivation, post harvest handling and allied activities. SKUAST-Kashmir/Jammu will be approached to accord priority to this area.

3.20 PACKING MATERIALS:

Appropriate steps will be taken for making available packing material of high quality standards at reasonable cost. New pack size will be designed to attract more and more consumers/clients.

3.21 INTEGRATED PEST MANAGEMENT:

For control of different pests and diseases, emphasis will be given upon integrated pest management. Cost of inputs for control of such diseases will be minimized/reduced through encouraging other non-monetary cultural practices.

3.22 Post harvest management and Food processing:

In view of the production of different fruits in the state and their perishable nature, the infrastructure of post harvest handling and

processing is a priority. Presently, the state does not have the required infrastructure and, as such, farmers/orchardists are facing difficulties.

In the post harvest management, focus will be laid upon creating facilities of fruit handling, packing, grading, storage, transportation under refrigerated conditions and setting up of cold chains.

Creation of required post harvest handling and processing facilities in production zones/areas will be a special focus. Efforts will be made to motivate private sector to invest in this sector. Attractive models for public/private partnership will also be developed to attract more and more investment in post harvest handling and processing sectors.

Food processing is one of the important segments of horticulture sector. The state Government will take adequate measures to promote food processing in the state. These measures will include;

- Setting up of food processing parks where units like cold store, CA store fruit processing plants will be installed. Private sector will also be motivated for setting up units at such parks.
- Common infrastructure like quality control laboratories, effluent treatment plants etc., will be developed in the food parks to facilitate the agro-processors and attract them towards setting up of such units.
- The revision/enhancement of assistance in respect of the existing GoI Schemes for the J&K state will be pursued with the GoI. Assistance to entrepreneurs under different State Government Schemes will be arranged.
- Training of youth in food processing will be taken on priority, so that proper human resource is developed to meet requirements of PHM and processing sectors.
- Efforts to arrange finances for food processed and PHM units at lower rate of interest will be taken by the Government.
- Arrangements for marketing of processed products of the state with the Ministry of Defence and other Government of Institutions/Ministries will be taken up.
- The organisation of exhibitions for marketing of processed products of the state outside the state will be accorded top priority.
- Branding of the processed products of the state will be taken up.

- Provision of incentives to such agro-processors, who excel in the production/quality, will be arranged so as to attract the entrepreneurs.
- The research for developing low cost technologies for developing different products shall be conducted and disseminated.
- The machines for primary processing of the horticulture/agriculture produce will be devised as a part of the priority focus of the research institutions.
- Efforts will be made for provision of interest subvention for specific period for setting up of post harvest handling and processing units.

Chapter-4

POLICY FRAMEWORK ON FLORICULTURE

- 4.1 The earlier restricted role of floriculture in maintaining and establishing the parks and gardens as green living spaces in the urban environments and select rural areas for raising aesthetic appeal has to change now towards conserving rare and threatened flowers of exquisite beauty; catering to the need of cut flowers in the growing florists market; encouraging flower growers to undertake flower cultivation in their farm lands, improving peoples' income generating activities and opportunities. While strategically aiming for all this, the prime role of our gardens in serving as destinations of tourist attraction have to sustain and increase.
- 4.2 Floriculture, being the sunrise sector, has got huge potential in the J&K State. J&K is endowed with diverse agro climatic conditions ranging from sub-tropical plains to mid and high hills. The current area of 400 ha under floriculture in the State looks very inadequate keeping in view huge potential of the State in this sector.
- 4.3 The wide agro-climatic diversity of the State has to be fully exploited in all the agro-climatic zones of the State by fully utilizing these regions for cultivation of flower plants.
- 4.4 The Floriculture related component of this policy seeks to exploit the untapped growth potential in the sector by strengthening the infrastructure and support system for promotion of commercial floriculture. The other facets of this vision include preserving the huge available biodiversity and promoting value addition for rapid growth of floriculture business, besides preserving and restoring the widely acclaimed heritage in the shape of splendid gardens and parks.
- 4.5 The identification and development of flower varieties/hybrids for all the agro-climatic conditions would be undertaken by the two Agricultural Universities. In the short term, SAUs shall procure promising varieties and hybrids from other institutions within and outside country as per market needs and suitability to different agro-climates. The above material shall be multiplied by the SAUs, line departments and growers. In the long term, efforts shall be made in all the agro-climatic zones on development of varieties and hybrids for specific agronomical traits and marketing needs. The two SAUs shall also be responsible for devising of standard and refined agro-techniques for flower varieties/hybrids for different agro-climatic conditions and dissemination of such information. The two SAUs shall be responsible for undertaking R&D in the sector. The endeavour would be to build a well organized, efficient and result oriented R&D system.
- 4.6 The research and extension linkages will be strengthened to improve quality and effectiveness of research and extension system. The extension system will be broad-based and revitalized and made farmer-friendly.
- 4.7 All the regions of the state are rich in genetic diversity. This diversity is being lost at an alarming rate and the trend has to be arrested. The SAUs and Department of Floriculture shall undertake surveying, identification, collection, selection, documentation and conservation of indigenous plants. Efforts shall be made to establish the state of the art Conservatories, one each by SKUAST-J and SKUAST-K representing all the climates of the State. In these conservatories and gene banks, all the flora of the State shall be maintained or conserved for long term use. Appropriate financial support for these conservatoires and natural gene banks shall be organised.
- 4.8 The Department of Floriculture shall facilitate the adequate and timely

- supply of quality inputs to farmers such as seeds, fertilizers, plant protection chemicals, bio-pesticides, machinery and credit at reasonable rates. Spurious inputs will be checked. Balanced and optimum use of fertilizers will be promoted together with the use of organic manures and bio-fertilizers to optimize the efficiency of nutrient use. Development, production and distribution of improved varieties of seeds and planting materials shall be recognized as a priority area. Besides, nursery establishment, in private sector, shall be encouraged. Likewise, protected cultivation shall also be promoted on large scale.
- 4.9 Concept of scientific packing, packaging, storage and transportation being the pre-requisites for the present day market shall be promoted on modern and scientific lines so as to achieve the commercial floriculture development with maximum economic returns. Emphasis will also be laid on the development of marketing infrastructure and techniques of preservation, storage and transportation with a view to reduce post-harvest losses and ensuring better returns to the grower. Introduction of crop specific packing and packaging technologies, refrigerated transport and storage facilities would be a priority to achieve appropriate value additions.
- 4.10 Steps would be taken for establishment of "Landscape and flower training institutes" at Srinagar and Jammu. This Institute will be helpful in training farmers in flower cultivation, nursery development and management, landscaping and would contribute to skill development of people involved in production, packing and trading. Infrastructure and manpower of the Department of Floriculture would also be strengthened.
- 4.11 A Bulb Propagation Centre will also be established in Jammu and Kashmir within five years from notification of this policy.
- 4.12 To keep pace with the vibrant and ever increasing demand for flowers, potential modern organized markets within and outside country shall be identified/created wherein the role of the department will be to facilitate the sale of the final produce. Continuous monitoring of prices shall be ensured in these markets through the Department of Floriculture.
- 4.13 Greater private sector participation through promotion of buy back arrangements shall be organised to boost investment in the sector to address the concerns of marketing. But while making these arrangements, no long term interest, whatsoever, shall be allowed to be created in respect of land.
- 4.14 Organising local and traditional flower festivals for popularizing floriculture, reviving old forgotten traditions, encouraging peoples' participation and conserving local rare and endemic species would be promoted.
- 4.15 A cactus garden in Jammu and a herbal garden in Kashmir shall be established in the first three years of notification of this policy by the two SAUs.
- 4.16 Knowledge sharing by different departments like SAUs and various other line departments of Agriculture Production Department shall be a regular feature for synergizing the effects.
- 4.17 Development, establishment, maintenance, storage/preservation of heritage gardens and parks in the state is bound to enhance the tourism potential in the state that will have multiplier effect on entire tourism related activities in the state, thus, leading to economic upliftment of the people. This not only necessitates the proper maintenance of available gardens and parks, but also calls for revival of such other old assets.
- 4.18 The Government will endeavour to address the investment needs of the sector, by creating a favourable economic environment for increasing capital formation and farmers' own investments by approaching financial institutions and by providing incentives under various schemes applicable. Bankers and financial institutions shall be persuaded to play pro-active role in the

developmental process and financial support to the flower growers at lower rate of interest. Flower crop insurance shall be introduced to insulate the farmers from distress caused by the natural disasters and for making the activity economically viable. Endeavour will be made to provide a package insurance policy for farmers, right from sowing of flower crops to post-harvest operations and marketing.

4.19 Appropriate regulatory mechanisms shall be devised for plant varieties protection and farmers rights. Regulatory framework would be appropriately strengthened or amended to achieve these objectives.

4.20 An effort shall be made by the Floriculture Department to compile useful inventory of rare flowers, flower regions and gardens & parks for use of eco-tourists.

Chapter- 5

POLICY FRAMEWORK ON SERICULTURE

5.1 Sericulture, being one of the traditional agro based cottage industries of the state producing high quality Bivoltine Silk, has contributed significantly in improving economic conditions of the rural masses and providing employment opportunities in pre and post cocoon activities. Presently, about 25000 rural families are associated with silkworm rearing earning income of about Rs. 11 crores annually. In addition, about one lac mandays are generated in private sector in different reeling units. In view of the increased economic needs due to the changing social status and persistent low growth in the agriculture sector leading to lower incomes, Sericulture has assumed special significance as an important subsidiary occupation supplementing incomes of farmers over and above the returns from other crops. The J & K state has a significant role in view of its salubrious climatic conditions in the country for production of Bi-voltine Silk. The Bivoltine Silk production has been one of the priority sectors of Indian Silk Industry, but its production is yet to meet the domestic targets even as India is the second largest producer of silk after China and the biggest consumer of Raw Silk and Silk Fabric. An analysis of trends in International Silk Production suggests that Sericulture has better prospects for growth in the developing countries than in the advanced countries. Currently, the domestic demand for silk, considering all varieties, is nearly 27,000 MTs, of which, only around 69% i.e. 18,505 MTs is produced in the country and the rest is imported mainly from China. The yawning gap between the production and the consumption will continue un-abated as the demand for silk consumption is not expected to whittle down due to the improvement in socio-economic status of the people.

The production of quality Bivoltine silk is still a challenge, but the J & K State, having enormous potential to produce Bivoltine silk of international grade, can help to reduce the dependence of the Country upon the imports of Bivoltine Silk.

The Sericulture Industry needs many backward and forward linkages, common facilities and integrated approach for

sustained development. The proposed policy envisages economic upliftment of the rural folk through sericulture. As a part of envisaged growth in this sector, the state needs to put itself on the fast track of achieving the leadership status in this sector by being leading bi-voltine silk producing state in the country and also making the corresponding and consequential strides towards 100 % consumption of cocoons produced within the state. This would necessitate opening up a value addition window by establishing a number of silk reeling cum weaving units in the state. The other components of the policy include improving productivity and quality of all the stages in the value chain through technological intervention, skill upgradation and participatory extension support.

The policy framework in the sector shall encompass the following essential elements:

- To improve the economic condition of farmers, especially those belonging to weaker and downtrodden sections of the society through this subsidiary occupation and make the State of Jammu & Kashmir a leading Bi-Voltine State of the country.
- To setup a target of 1600 MT of cocoon production by the end of XII Five Year Plan with a definite plan to increase A grade Cocoon Production from present level of 75% to 95% and B grade from 20% to 5%. Likewise, the productivity/ozs of seed at the farmer's level will be increased from 35% to 60%. Similarly, with improved cocoon quality, efforts will be made to reduce the Renditta from present level of 9 -9.5 Kg to 8 kgs.
- Under plantation policy to increase the quantity of quality mulberry foliage, mulberry clusters will be developed wherein plantation of improved mulberry varieties will be made through farmers and also leaf reserves will be created on the government/community lands. The department intends planting improved / recommended varieties,

since the effective mulberry acreage on which silkworm rearing is conducted has got reduced due to urbanization.

- The department annually establishes about 600 incubation—curn- Chawki rearing centres, which, till the beginning of 10th plan, were established on rented accommodation of the farmers. Presently, about 60-70% hatched worms are directly distributed among the silkworm rearers in the state. It will be an important object to ensure 100% distribution of Chawki reared worms to rearers to increase the profitability of rearers by construction of more Chawki rearing centres.
- In order to completely consume cocoon produced within the state for value addition, there is need to establish more reeling units in the private sector and to upgrade the existing weaving units. A definite framework needs to be put in place to establish more reeling units in the private sector in the state, so that the whole of cocoon produced within the state is indigenously consumed.

5.2 Strategic planning for sericulture development:

i) Support price mechanism for distress sale

Cocoon growers of state have been offered un-remunerative prices for their produce for quite some time now primarily due to availability of low priced Chinese silkianarkets in abundance. In order to address this issue, a viable price mechanism shall be evolved. The policy environment surrounding the marketing of the cocoons shall be improved. A crises management fund is an extremely viable option to meet such exigencies during distress sale conditions.

ii) Double Cropping :

J&K State is a monocarp region. Recently, double cropping has been introduced successfully in certain areas. For this, a holistic package is being adopted and lead farmers identified for dissemination of technology. With the introduction and popularization of second crop in the State, the productivity per unit area is expected to increase, since plenty of mulberry leaf is

available during autumn season, which otherwise goes as waste. This would also compensate the farmers by offsetting low cocoon prices and, at the same time, generating additional income during lean season. In the proposed policy, special incentives would be provided to the farmers to encourage double cropping in the state on a large scale.

iii) Production of Quality Silkworm Seed:

Presently, about 70% of the total requirement of seed is locally produced by the state and the balance is purchased from the grainages of CSB located in the country. In order to produce cent percent seed within the state, the existing infrastructure will be upgraded and even production base will be enhanced by way of construction of Bivoltine Seed production Units within the state, which will be a significant step towards self sufficiency in seed production.

iv) Establishment of Reeling Units in Private Sector:

Presently, about 30% of local cocoon crop is consumed while about 70% produce goes outside the state due to insufficient number of reeling units established in private sector. In order to up the consumption to cent per cent levels, sufficient number of reeling units will be established in the state.

v) Technology Up-gradation at farmers level:

It will be achieved by providing necessary modern rearing equipments and support for rearing accommodation to farmers under transfer of technology programme for production of quality cocoons.

vi) Equitable Development of different Sectors:

Almost every sector of sericulture viz; Mulberry Sector, Seed Production Sector, Cocoon Production Sector and Post Cocoon Sector provides ample employment opportunities. To enhance employment opportunities under these sectors, necessary intervention/support from the available resources will be provided for equitable development of these sectors.

vii) Sericulture in New Areas:

The manpower available with the department will be trained to explore possibilities of introducing sericulture into new areas appropriately backed with all possible interventions and support through different schemes.

viii) Augmentation of area under host plant development:

It will be achieved by propagation of exotic/improved mulberry varieties both in the private and the departmental nurseries for which the department has established about 170 mulberry nurseries in the state in the public sector alone, covering an area about 963 acres, which will be up-scaled to the full production capacities through various interventions. The improved plant

materials will be supplied to farmers to achieve the object.

5.3 STRATEGIES/CONVERGENCES REQUIRED IF ANY:

Convergence of development schemes in sericulture with other major flagship schemes of Agriculture, Rural Development and Industries departments shall be strategized for effective pooling of resources and optimum gains. Besides, appropriate linkages/interface with the SAUs on the leading edge issues of research in the sector shall be established and effectively leveraged for a holistic development of the sector in the State.

Chapter-6

POLICY FRAMEWORK ON MANAGEMENT OF WATER RESOURCES

6.1 Besides various other uses, the largest use of water in the world is for irrigation of farm lands. Irrigation means a continuous and a reliable water supply to different crops in accordance with their needs. When sufficient and timely water does not become available to the crops, they fade away resulting in lesser yields. Even though, J&K is having sufficiently *large* water resources, they are not spread in time and space and because of which, droughts and floods do occur sometimes in the state. To avoid recurrence of such events, it is necessary to properly conserve the water during high floods and utilize them during droughts.

6.2 Considering these facts, the highest priority has to be accorded to the development of water resources of the State. There is also need to create awareness among all farmers, urbanites and public, at large, for effecting economy in using the precious water resources. In order to create consciousness and lay down practices and procedures, administrative arrangements and regulation for fair distribution and utilization of water resources by different beneficiaries, a well defined comprehensive water policy is imperative. In the agriculture policy, the element of the management of water resource shall have the following thrust areas:

- Water is a prime natural resource, a basic human need and a precious national asset. Therefore, planning development and management of water resources shall be governed both from the state and national perspectives.
- The available resources of both surface and ground water shall be made utilizable to the maximum extent. Efforts to develop, conserve, utilize and manage this important resource in a sustainable manner shall be in the larger interests of community as a whole.
- Growth process and the expansion of economic activities inevitably

lead to increase in demands of water for diverse purposes i.e. domestic industrial, agricultural hydro power navigation, recreation etc. Planning of projects for development of water resources shall as far as possible be for multiple benefits based on integrated and multi disciplinary approach having regard to human and ecological aspects

- Ground water potential shall be periodically reassessed and its exploration regulated with reference to recharge possibilities and considerations of social *equity*.
- Water rates shall be such as to foster motivation for economy besides covering maintenance and operation charges.
- Farmers shall be progressively involved in the management of this scarce resource.
- In flood control and management, the strategy shall be to reduce the intensity of floods by sound water shed management, adequate flood cushioning in water storage projects, wherever feasible, and by an extensive flood forecasting network.
- Land erosion by river and nallahs shall be minimized by suitable cost effective measures. Indiscriminate occupation and economic activity in flood plains shall be restricted and regulated.
- Needs of drought prone areas shall be given priority in the planning of projects for development of water resources. These areas can be made less vulnerable through soil moisture conservation measures, water harvesting practices, development of ground water potential and transfer of water, wherever feasible. Modes of

development, such as, pastures and forestry, which demand less water, shall be encouraged in these areas.

6.3 INFORMATION SYSTEM:

A well developed information system, for water related data in its entirety at the state level is a prime requisite for resources planning. A standardized information system shall be established with a network of data banks and data bases, integrating the various agencies involved for improving the processing capabilities. Standards for coding, classification, processing of data and methods of procedures for its collection shall be adopted. Apart from the above, the system shall also include comprehensive and reliable projections of future demands of water for diverse purposes.

6.4 WATER RESOURCES PLANNING:

Water resources development and management will be planned for a hydrological unit such as drainage basin as a whole or for sub basin taking into account surface and ground water sustainable use, incorporating quantity and quality aspects as well. All individual developmental projects shall be formulated and considered within the framework of such an overall plan.

6.5 WATER ALLOCATION PRIORITIES:

In the Planning and Operation of hydrological systems, water allocation priorities should be broadly as follows:

- i) Drinking water
- ii) Irrigation
- iii) Hydro Power
- iv) Ecology
- v) Agro-industries and non agricultural industries,
- vi) Navigation and other uses.

6.6 Water resource development projects shall, as far as possible, be planned and developed as multipurpose projects with primary consideration for drinking water and irrigation water.

6.7 The study of the likely impact of the project during construction and later on human lives, settlements occupation, socio-economics, environment and other

aspects shall form an essential component of project planning.

6.8 There shall be an integrated and multi-disciplinary approach to the planning formulation, clearance and implementation of projects including catchment area treatment environmental and ecological aspects, the rehabilitation of effected people and command area development. The planning of the projects in hilly areas shall take into account the need to provide assured drinking water, possibilities of hydropower development and the proper approach to irrigation in such areas.

6.9 However, the priorities could be modified or added, if warranted by the area/region-specific considerations.

- Special efforts shall be made to formulate irrigation plans for the benefit of areas inhabited by tribal and other socially weak groups, such as, scheduled castes and scheduled tribes.
- The drainage system shall form an integral part of any irrigation project from the planning stage.
- The involvement and participation of beneficiaries and other stakeholders shall be encouraged right from the project planning stage.

6.10 GROUND WATER DEVELOPMENT:

Integrated and coordinated development of surface water and ground water resources and their conjunctive use, shall be envisaged in the project plan ring.

6.11 IRRIGATION:

- Irrigation Planning, either in an individual project or in a basin, as a whole, shall take into account the irrigation of land, cost effective irrigation options and appropriate irrigation techniques for optimizing water use efficiency.
- There shall be a close integration of water use and land use policies.
- Concerted efforts shall be made to ensure that the irrigation potential created is fully utilized.
- Irrigation being the largest consumer of fresh water, the aim will be to get optimal productivity

per unit of water, Scientific water management, farm practices and sprinkler and drip system of irrigation especially in high level caravas will be adopted, wherever feasible

- Reclamation of water logged land by cost effective methods shall form a part of command area development programme.

6.12 FINANCIAL AND PHYSICAL SUSTAINABILITY.

Besides creating additional water resource facilities for various uses, adequate emphasis needs to be laid upon the physical and financial sustainability of existing facilities. The water charges for various uses shall be fixed in such a way that they cover at least the operation and maintenance charges.

6.13 PARTICIPATORY APPROACH TO WATER RESOURCES MANAGEMENT.

Management of the water resources for diverse uses should incorporate a participatory approach by involving not only the various governmental agencies, but also the users and other stakeholders in an effective manner in various aspects of planning, design and development and management of water resources schemes. Necessary legal and institutional changes shall be made at various levels for the purpose.

6.14 WATER QUALITY:

- Both surface and ground water shall be regularly monitored for quality.
- Effluents shall be treated to acceptable level and standards before discharging them into natural streams.
- The State Govt. has recently enacted Water Resources (Regulation and Management) Act

2010, which would be enforced in letter and spirit.

6.15 WATER ZONING:

Economic development and activities including agricultural industrial and urban development, shall be planned with due regard to the constraints imposed by the configuration of water availability. There shall be water zoning of the state and the economic activities shall be guided and regulated in accordance with such zoning.

6.16 CONSERVATION OF WATER.

- Efficiency of utilization in all diverse uses of water shall be optimized and an awareness of water as a scarce resource shall be fostered. Conservation awareness shall be promoted through education, regulation, incentives and disincentives.
- Water resources shall be conserved and its availability augmented by maximizing retention, eliminating pollution and minimizing losses. For this, measures like selective linings in the conveyance system modernization and rehabilitation of existing systems including tanks, recycling etc. shall be taken.

6.17 TRAINING

A perspective plan for standardized training will be an integral part of water resources development. It will cover trainings in information systems, sectoral planning, project planning and information, project management, operation of projects and their physical structures and systems and the management of the water distribution systems. The training shall be extended to all the categories of personnel involved in the activities as also the farmers.

Chapter-7

POLICY FRAMEWORK ON LIVESTOCK SECTOR

7.1 The agriculture, including livestock, contributes 25.94 % to the Gross State Domestic Product at constant prices, of which livestock has a contribution of 11 %, which is about 40 % of the agriculture and allied activities. This contribution is excluding the draught power of the livestock used in ploughing and other transport. In absolute terms, the sector contributes Rs. 3240 crore to the state economy at current price as per Gross State Domestic Product.

The contribution of livestock to the state economy is higher than horticulture and crop sector, therefore, this sector deserves an adequate focus in the agriculture policy. The Livestock breeding policy of the state of Jammu and Kashmir has taken into consideration the uniqueness of the state in terms of its agro-climatic and geographical positioning within the country. This component of the agriculture policy is also built on the edifice of the unique geographical and natural endowments of the state. The policy in the space shall have following components:

7.2 BREEDING INTERVENTIONS IN CATTLE AND BUFFALO:

Augmentation of milk productivity and quality: Up gradation with exotic (Jersey and Holstein Friesian H.F) germ plasm shall form the main activity associated with genetic up-gradation in these species of large ruminants for ensuring food and nutritional security for the state. Artificial insemination shall be the main tool to achieve the hybridisation driven productivity in cattle. Non-descript local scrub bulls shall be castrated. Specific breeding interventions will include the following:-

i) Cattle:

- The State shall employ Jersey and HF breeds for cross breeding of cattle in the state. However, the cross breeding with HF shall be done in plain and irrigated areas of the state while as Jersey germplasm shall be used for cross breeding in semi-hilly and hilly areas of the state.

- The exotic inheritance of both the breeds shall be restricted to 50% only.
- Stress shall be given on selection of quality half bred bulls of local and exotic inheritance for stabilization of desired level of inheritance. To realize it, Open Nucleus Breeding System (ONBS) shall be established in all regions of the state.
- Till such time in Jammu region, the recognized indigenous breeds viz. Haina and Sahiwal, shall constitute the indigenous component of cross-bred bulls.
- In other parts of the state, elite local females shall be identified and inseminated with elite semen (H.F and Jersey) to produce the quality half-bred bulls for use in genetic improvement programmes.

ii) Buffalo:

- Up-gradation of the local buffalo population using frozen semen of the selected sires of Murrah through artificial insemination.
- Upgradation of buffaloes in border areas of R.S. Pora, Kathua and Samba shall be done by introduction of germ plasm of Nih Ravi breed.

7.3 BREEDING INTERVENTIONS IN SHEEP:

- Emphasis will be given on production of mutton. In addition, a dual purpose (wool and mutton) breed shall be evolved by appropriate selection and breeding methods.
- The cross breeding of local sheep with fine wool breeds like Merino and Rambouillet (with exotic inheritance up to maximum 75%) shall be continued in uncovered areas. Selective breeding of 3/4 exotic and 1/4 local inheritance shall be stabilized with more stress on mutton traits.

- Muttonous breeds shall be introduced in the state in view of huge gap in demand and local supply. But the gains made in the traits stabilized for production of fine wool in the local crosses shall be ensured to be maintained and not diluted in any case. Region specific strategies will include the following:-

i) Kashmir division:

- Stabilization of inheritance level (75% merinos 25% local) by selective breeding with stress on mutton production shall be ensured. The gains obtained in fine wool shall be maintained (at least 23 micron fibre diameter).
- The breeding of dual purpose sheep of Corriedale breed (with exotic inheritance up to maximum 75%) in orchard areas of Kashmir Division shall be continued.
- Appropriate levels of inheritance of muttonous breeds, like Dorper and local sheep, shall be identified and introduced after performance evaluation in the orchard production system of Kashmir.
- In-situ as well as ex-situ conservation of threatened sheep breeds of the divisions of Gurez and Karna shall be ensured.
- Efforts shall be made for introduction of highly prolific genes in sheep for production of twins and triplets for vertical/horizontal growth.

ii) Jammu division:

- Stabilization of inheritance level (75% Rambouillet- 25% local) by selective breeding with stress on mutton production shall be ensured. The gains obtained in fine wool shall be maintained (at least 24 micron fibre diameter). Breeds, like Dorper and local sheep shall be identified and introduced after performance evaluation in the plain belts of Jammu Division.
- In-situ as well as ex-situ conservation of threatened sheep breeds of the division (*Baderwail*, *gaddi* and *Punchi*) shall be ensured.

- Efforts shall be made for introduction of highly prolific genes in sheep for production of twins and triplets for vertical/horizontal growth.

iii) Leh district:

- Breed improvement of *Changluk* sheep for dual purpose (mutton and wool) shall be taken up by selective breeding
- The existing policy of cross breeding of sheep of Ladakh, with merinos in certain pockets, shall be dispensed with and replaced by selective breeding with Malluk and its cross breeding with *Changluk*.

iv) Kargil district:

- Selective breeding amongst the local sheep in whole of Kargil shall be taken up.
- The breeding of Merino Sheep for fine wool in specific pockets of Kargil, where it has proved successful, shall be organised.
- In view of the acceptability of *Karakul* breed of Sheep for enhanced mutton production, the same shall be continued, as per the present practice, in selective areas of Kargil district.
- Pilot studies on introduction of *Changluk* inheritance in sheep native to Kargil shall be taken up to ascertain their combining ability.

7.4 BREEDING INTERVENTIONS IN GOATS:

- There are some unique genetic resources in the form of *Pashmina/Changra* goats and big sized *Khagani* goats. Besides these, there are some non-descript local breeds too. Accordingly, the policy for this sector shall be oriented towards augmentation of quality *Chevon* and fibre production through appropriate breeding technologies. Region specific strategies will include the following:-

i) Kashmir division:

- *Khagani* breed shall be used as an improver breed in non-descript local

flocks because of its reported quality performance under temperate climates.

- Appropriate levels of inheritance of Boer breed shall be identified and introduced after performance evaluation.

ii) Jammu division:

- Augmentation of *Chevon* production by selective breeding in private flocks of *Khagani* breed of goat shall be aimed at.
- In-situ conservation of local *gaddi* goat shall be taken up. Introduction of *Beetel* breed of goat from Punjab/Himachal Pradesh in *Kandi* belt and *Shivalik* hill ranges of Jammu Division shall be done after evaluation of performance traits.

iii) Leh district:

- Selective breeding of *Pashmina* goats shall be taken up in traditional areas of Leh District. Its further propagation in non traditional areas shall also be taken up.
- Performance studies of *Maira* goats with regards to production of fibre and *Chevon* shall be done along with its combining ability with *Pashmina/Changra* goats for better fibre and *Chevon* production.
- Angora goats presently having low acceptability with the breeders of Leh shall be phased out and replaced by *Changthangi* as an improver breed.
- Exotic/indigenous breeds shall be introduced in Nobra and other areas of Leh district.

iv) Kargil district:

- Introduction of Exotic/indigenous *germplasm* in local goats of Kargil district for augmenting milk production in selected areas of the district.
- Propagation of *Pashmina* goats in non-traditional areas of Kargil district shall be taken up.
- Selective breeding of local goat for higher growth in *Chevon* production shall be carried out.

- The combining ability of local goat germplasm with *Changra* goat for *pashmina* production shall be explored.

7.5 BREEDING INTERVENTIONS IN POULTRY:

There is a wide gap between demand and production of poultry and poultry products in the State. The activities in this sector need to be augmented to the maximum. However, due to high cost of egg production under intensive poultry (eggers) in temperate zones because of competition of organized poultry sector with humans for grains, development of region specific dual purpose bird for backyard poultry sector merits consideration.

This sector shall also be diversified by introduction of new variants of Poultry species after conducting validation trials in specific areas. The strategy wise include the following:-

Development of area specific, self propagating, self sustaining, colored bird of dual purpose (meat and egg) for backyard sector shall be treated as a priority.

- Till the development of contemplated bird, the birds developed elsewhere in the country shall be propagated after validation of their performance.
- The policy shall aim at increasing production of eggs and poultry meat by popularizing low input technology birds in backyard farms and also by encouraging broiler farming.
- Selective breeding of local ducks with the objective of evolving a better performing duck in the backyard shall be executed.
- Duck (*Khaki Campbell*), Japanese Quail farming and Emu farming shall also be taken up to augment the poultry meat production and to meet the requirement of consumers of these birds.

7.6 OTHER LIVESTOCK SPECIES:

- Double Humped Camel Yak and Zanskari Horses are other domestic farm species of specific importance to certain areas, especially the trans-Himalayan

region of Ladakh (Leh and Kargil) for their abilities to survive extreme climate, thrive on coarse feed and fodder and work as beasts of burden in difficult topography.

- Despite strategic and socio-economic importance, their

production remained neglected in the past. The immediate problem is their dwindling population and rampant in-breeding, which under this policy, shall be addressed.

Chapter-8

POLICY FRAMEWORK ON MANAGEMENT OF FOREST RESOURCES

8.1 The complementary nature of sound forests and agriculture is a great enabler towards an improved ecosystem and food security. The role of forests in the ecologically sustainable and economically desirable agricultural systems cannot be underestimated and it is this organic linkage that constitutes another significant element in this policy. The policy aims at using the forest wealth in supplementing the growth in agriculture in the following ways:

- The health and nutrient status of agricultural land, particularly in hilly areas depends on the state of forests, its quality and wildlife present therein. The afforestation measures, sound management and conservation of forests through reforestation and other modern scientific techniques will not only enhance the forest productivity but also assist in soil nutrient conservation, reduction of soil erosion, enhance hydrological cycle and help in pest management as well. Thus, afforestation, reforestation and soil moisture conservation measures in degraded catchments on watershed basis will be effective tools in promoting the agricultural growth in the state.
- The use of agriculture land for activities like manufacturing brick kiln, construction of houses and other commercial activities shall be discouraged and, if necessary, non-productive or least productive land shall be encouraged to be utilized for these purposes.
- Promotion of Agro-Forestry: The proper land use policy for agriculture is required to be implemented. Different agro-forestry models, suitable for different types of land on the fringes of the forest, will be desirable to optimize the benefits and to meet requirement of fuel timber and fodder of the people locally. The Land Use Board will be encouraged to strictly enforce the agricultural laws for proper land use in this regard.
- Raising of medicinal plants: The private lands adjoining the forests shall be used for raising medicinal plants in synergy with forest conservation so that livelihood needs of neighbouring villagers are adequately met. This will enhance the productivity of the soil and improve the economic condition of the people and generate raw material for Ayurvedic enterprises.
- Encouragement of Horticulture plantation: Wherever possible, the horticulture plantation shall be encouraged on private lands. The microclimate required for these plantations can easily be maintained with the sound health of surrounding forests.
- Impetus shall be given to floriculture, bee keeping, mushroom cultivation and other related enterprises in the wasteland adjoining forest to bring the uncultivable land to productive use.
- These activities on private lands will also enhance the livelihood needs of local population and reduce pressure on forest lands. Many items like 'Anardana'/'Amla' has huge market. These products will be encouraged by ensuring the sale of produce by cooperative marketing federation or in local 'Mandis'.
- Development of pastures and grazing lands: While developing the forest and available waste land, pastures and grazing land, shall be developed as per suitability of land and live stock requirement. The Sheep Husbandry Department shall develop traditional pastures in coordination with the Forest department. However, grazing must be restricted to carrying capacity of the pastures and, accordingly, rotational grazing shall be operationalized for better health of the pastures. The grasses, legumes etc. will be encouraged with suitable silvi-pastoral models. The traditional grazing areas shall be

restored, which will improve the surrounding forest areas.

- The importance of the forests in conservation of soil and water regime and enhancement of river flow, ground water penetration and discharge can't be overemphasised. For this purpose, specific identified aquifers, in consultation with Central Ground Water Board, shall be developed in the micro watersheds.
- The agricultural land along nallah / rivers shall be protected by adopting appropriate flood control measures, both vegetative and mechanical.
- High priority shall be accorded to conservation of forests as a well stocked forest cover would be

helpful in soil, moisture and nutrient conservation at micro level in the watersheds, which would automatically enhance the agriculture production. If the present state of denudation / degradation and shrinking of agricultural land continues unchecked, it would adversely affect the agriculture and allied sectors, which, in turn, would be disastrous for environment.

- A Fodder Development Board comprising experts from the Forest, Agriculture, Animal Husbandry, Sheep Husbandry and Rural Development Departments shall be constituted for development of pastures. Fodder and Feed Banks shall be opened at appropriate places for supply of feed to farmers.

Chapter-9

POLICY FRAMEWORK ON COOPERATIVES

9.1 It has rightly been said that agriculture is the backbone of economy and cooperatives are the backbone of agriculture. Cooperative institutions mostly owe their existence to the distribution of agricultural inputs. Cooperative institutions have played an indispensable role in popularizing the use of fertilizers among farmers for increase in production and productivity. Alongside modernization in the agricultural techniques, fertilizers have proved to be an important factor in the increase in crop production. It is estimated that about 50% increase in crop production could be attributed to fertilizer usage alone, and further increase in the yield comes through increased and efficient use of other agriculture inputs, including quality seeds etc.

Cooperatives are believed to be the only reliable source of agriculture inputs, farm credit, consumer items etc., in view of their extensive outreach in the hinterland. In the past, they occupied an important position in the distribution of inputs in the agriculture landscape. Recently, their role though has considerably shrunk. Considering the role they can potentially play in the agricultural growth, it is important to re-build trust in Cooperatives and restore its earlier profile, so that they re-emerge as the tools of economic growth.

9.2 This policy shall seek to revive the cooperative movement in the state by not only reviving the activities already dealt by these cooperatives, but also bring in other allied sectors under the ambit of cooperatives, where there is tremendous scope for cooperative enterprise like encouraging crop-specific farmers' cooperatives in such sectors as vegetable, horticulture, floriculture, bee keeping, mushroom cultivation, dairy farming, etc.

9.3 The policy will aim at achieving the much needed revival of the cooperative sector in the following ways:

- The Cooperative department shall create awareness, particularly among the rural masses, by educating them about the advantages of cooperative system of working vis-a-vis other systems.

- The department will discourage the development of 'Recipient' mentality in the minds of the members
- The department shall hold seminars and awareness camps for motivating people towards forming cooperatives in the newer areas.
- The number of registrations of the cooperatives shall be attempted to be increased by 10% every year.
- The department shall make efforts for revival of dormant societies/cooperatives and also launch a drive to enlarge membership base of existing cooperatives.
- The department shall market surplus produce at remunerative prices and dispense with the role of brokers and middlemen/traders.
- The department shall promote the setting up of cold stores and controlled atmospheric (CA) Stores and refrigerated transport system for perishable commodities amongst the cooperatives.
- The department shall provide networking facility to cooperative societies, so that they can interface with the prosperous cooperatives in other states and learn the best practices of management.
- Infrastructure requirement of Cooperative Societies shall be strengthened through assistance under various state and central schemes.
- The department shall arrange for the creation of fertilizer storage capacities by way of constructing/renovating godowns and renting out godowns to the fertilizer manufacturing companies for buffers stocks/emergency interventions.
- The department shall ensure hassle-free flow of credit to the farmers through PACS and cooperative Banks.

- The development shall promote the development of the commercial poultry through the cooperatives, besides initiating steps to form cooperatives for the development of tourism and health sector.
- Convergence of the ongoing schemes funded by the NCDC under different sectors like poultry, dairy, tourism, etc with existing cooperatives in the sector is being worked out. ICDP projects under implementation will also help in revival of the cooperatives and improving the delivery of services to the rural masses.
- The revival of the cooperative credit structures in terms of the recommendations of the Vaidyanathan Committee is underway in the State. ICDP projects and poultry projects are under implementation with the funding of the NCDC and more projects shall be taken up in case there are takers from the public at large.
- Banking sector requires complete overhauling to face up to the competitive pressure unleashed by the commercial Banks. Similar such initiatives are required to be taken in the marketing cooperatives and the consumer cooperative stores. All such reforms shall be initiated in the sector in close synergy with the agriculture sector.

Chapter-10

POLICY FRAMEWORK ON ORGANIC AGRICULTURE

- 10.1 Large part of the area of the state is under pastures, forests and other kinds of wild lands, water bodies, wasteland, which is largely used by local farming communities for grazing of cattle and as a source of fodder. The area is naturally organic holds significant potential of being designated as certified organic.
- 10.2 The hilly farmlands, being poor in organic carbon, require ways to supplement it for sustainable agriculture. Presently, farmers have been making use of chemical fertilisers to maximize production on these farmlands. Negative effects of such practices are already visible. Soils already in intensive use for vegetable farming and orchards are showing the fatigue factor, indicated by rising need for more inputs, lesser production and increasing incidence of crop diseases on these croplands. Also, the soil systems retain less moisture, and have little living soil flora and fauna, which is so very essential for supporting natural ways of maintaining soil fertility. Thus, improving health of mountain farmlands and valley lands must be an important strategic need of organic agriculture in the state. Inorganic fertilisers are and will never be the sustainable option of maintaining productivity in these regions. Maintaining healthy soils of these crop lands will produce healthy crops, build their resistance capacities to diseases and improve quality of the produce.
- 10.3 The fruit growers of Kashmir valley are today compelled to increase use of pesticides, which not only increases the cost of production, but also compromises the quality of produce and food safety. Organically grown fruits will have better quality and have price realisation (premium prices in case of certified organic). Experience shows that the produce of organic farmers, even if uncertified, sells readily and is relatively more remunerative. The direction and volume of fruit business in the Valley can change drastically by adopting organic ways of farming.
- 10.4 Farmers do benefit from niche based crops. The niche value of these commodities can be further enhanced by producing them organically. It is in these areas, and for these commodities, that certified organic label or Kashmir organic brand will add further value. If only 20 % fruit produce in the state was to be grown organically, as per one estimate, it can add value of Rs 100 crore in absolute terms. This steep improvement in incomes of the farmers should be reason enough for them to go organic. The agro-tourism has great potential in the state. The potential growth in the organic agriculture is an opportunity to add value to home stays by developing linkages with the tourism sector and christening the new paradigm as 'ORGANIC AGRICULTURE TOURISM'.
- 10.5 Organic Agriculture Perspective — spirit of the policy:
- Organic agriculture is a unique production management system, which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles and soil biological activity, and this is accomplished by using on-farm agronomic, biological and mechanical methods to the exclusion of all synthetic off-farm inputs. However, organic is not only about replacing inputs, in fact, it transcends the input driven approach, and encompasses the following principles of organic agriculture to improve agriculture;
- Principle of health: Organic agriculture should sustain and enhance the health of soil and plant, animal, human and planet as one and indivisible.
 - Principle of ecology: Organic agriculture is based on living

ecological systems and helps sustain them.

- Principle of fairness: Organic agriculture should build on relationships that ensure fairness with regard to the common environment.
- Principle of care: Organic Agriculture should be managed in a responsible manner to protect the health and well-being of current and future generations as well as of the environment

10.6 Mile stones to be achieved in the organic regime by 20-20:

The organic component of the policy, as a subset of the larger set of the policy, looks at achieving below noted milestones for ushering in near total organic environment in agriculture by 2020:

- By 2020, the state would have supplied and enabled farmers and public with well organised organic market infrastructure.
- Most farmers in the state will be doing organic cultivation on their farm lands. Profitability of the farmers will have increased by reducing input costs. The state, too, will have benefited by savings on fertilizers and clean environment, which in turn may lead to wide ranging benefits including strengthening the economy.
- Organic Certification of the forests and pasture lands of the state, generally used as grazing lands will have been done with corresponding and consequential benefits. Organic Certification of these lands will mean that every product coming from these forests will be certified organic wild harvest. More significant is the fact that these lands will then serve as a source of certified organic fodder, and that will enable farmers to maintain and sustain organic status of their livestock. It is not only necessary to source the organic milk of buffaloes and cows, organic mutton of sheep and goats, but also organic farm yard manure (FYM). Sourcing organic grazing lands and fodder for cattle to produce organic FYM will be important for the farmers obtaining certified organic status.
- By 2020, mainstreaming organic farming in the state will have

reduced the need for subsidies on chemical fertilizers.

- By 2020, organic agribusiness will have become an attractive opportunity to the educated youth of the state and create jobs for others in the organic agribusiness sector, such as, on farm and post harvest handling and marketing of the products.
- The regions of Kashmir and Ladakh would have been chosen to develop organic villages for agro tourism, as part of the tourism development strategy of the state. The strategy will help convert organic products into services with very high value addition.
- The state would have taken steps to build strong institutional capacities and human resources in the state to implement appropriate organic strategies so as to achieve the mission targets.
- Credible brands, namely, Kashmir ORGANIC, JAMMU ORGANIC and LADAKH ORGANIC would have been launched under which several organic commodities of the state are marketed.

10.7 Implementation Strategy:

To accomplish the above organic mission, there is need to devise clear strategies to achieve the goals. The strategies will build on the factors and processes of the benchmark scenario.

- The state would need to adopt policies to promote natural resource based organic agriculture, keeping soil health, sustainability and productivity as prime focus.
- As a first step, the state shall give due consideration to the farming needs, potential niches as strengths for commercial development, and to perils of not adopting alternatives. Further, the institutional and human resources capacities of the state would need to be strengthened so as to enable it implement various components of the programme across all agro-ecological zones and production domains.
- At present organic farmers of the state do not enjoy a level playing field vis-à-vis the conventional agriculture farmers in terms of incentives and subsidies for various farming operations. These farmers would be supported with

appropriate financial and technological handholding.

- There will be an absolute need of mass awareness about the potentials of organic farming amongst farmers, consumers and the civil society as a whole. It calls for adopting different approaches to bring awareness among different sections of the farmers and society. Some of the important interventions shall be;
 - Organising and/ or supporting meetings, conferences, seminars, workshops, national and international trade fairs, exhibitions and organic haats etc.
 - Awareness through print and electronic media.
 - Publications on several aspects of organic agriculture need to be supported; namely, popularisation of innovative practices, production and quality control of inputs, region specific management practices etc.
 - There is need to invest in building critical cadre of first generation scientific manpower in organic subjects and other agencies in organic agriculture.
 - There is need to set up farmer fields based demonstration cum experimental models comparing organic versus conventional agriculture.
- There is need to invest in research on critical issues of technology validation, refinement and innovations in organic agriculture and support SAUs and other agencies including NGOs in undertaking these issue based research activities.
- There is need to set up model organic farms of the farmers as training centres and build cadre of Farmer Trainers
- There is need to set up a third party organic certification body within the state and facilitate local service providers for organic Internal Control Systems.

10.8 The switch over to organic farming shall have to be implemented by the state Government under a MISSION MODE APPROACH. That would mean that a nodal agency with a clearly defined mandate oversees its implementation. It has to be an integrated programme where under several departments of the Government would have to be involved. Therefore, the status and organogram of the nodal agency should be such that it has credibility across departments and is able to implement activities with their involvement.

Chapter 11

POLICY FRAMEWORK ON AGRICULTURAL RESEARCH AND EDUCATION

11.1 Agrarian distress of J&K:

Green revolution technologies are scale neutral but not resource neutral. The inputs bear direct co-relation with the outputs. Experience shows that the vast areas inhabited by resource poor farmers of the state have remained outside the benefits of the universally acclaimed green revolution technologies. The crops and cropping systems on the un-irrigated sloping farmlands were not touched by the green revolution technological options. Even as there is an urgent need to scale up food grain production to meet the annual shortfall of 5 MTs of food grains, the downsides represented by the shrinking crop lands, declining water availability, technological fatigue, and the lack of timely and adequate input services support are coming in the way of stemming the migration of farmers to other profitable enterprises.

11.2 The stagnation in the agriculture growth in recent years has brought into focus new sectors and regions. Livestock, fisheries, horticulture and specialty enterprises (spices, medicinal aromatic, organic) represent low volume high value crop segment. The share of high value agriculture in total agriculture has gradually increased over the years and today it accounts for a little less than a third of the total value of agriculture. This segment is highly perishable in nature and needs a different approach than that followed in the case of food grains. The agro-ecological environment of the state has a distinct and widely recognised niche for this high value agriculture.

11.3 Paradigm shift to strengthen Technology led Revitalization of Agriculture in J&K.

At a time when, dependence of farmers on agriculture, both for food and economic security is declining and new generation of youth is moving away from farming, the challenge lies in giving new direction to technological research so as to help contain and reverse the trend. And this sets the farm research agenda for the future in J&K. The state is fortunate to have, both wet and dry, temperate agro-climatic regions, plenty of water bodies, waste forest and pasture lands, which

offer it distinct comparative advantages of diversity of farming cultures, such as, rice, horticulture and saffron farmers in the valley to maize and potato farmers in the Jammu region to the 'bakkarwals', yak herders and shepherds of Changthang. Such diversity needs to be considered as an opportunity not a constraint. Opportunity lies in redirecting research to address issues of their farming cultures to make these productive and sustainable. Diverse technological solutions to diverse problems leading to diversity of sustainable farming cultures—has to be the vision of farm research for the mountain state.

11.4 Technology is the engine of growth and transformation and must, therefore, address the above issues for sustainable growth opportunities. In association with traditional and conventional technologies, cutting edge technologies, such as, biotechnology, ICT, space and GIS for land use planning, and weather forecasting etc. will need to be channelized to meet the needs of farmers of the state.

11.5 In the state, the generation and dissemination of technology is hampered not only by lack of investible resources, but also by its sub-optimal priorities across crops, regions and institutions, and lack of support in most of the public research institutions. Broadly, the issues related to technology can be put in two categories. One, where productivity levels are high and moved closer to the economic potential. Two, where productivity levels are low and far below the economic potential of available technology. The former require breakthrough in technology and the latter require extension and favourable policy environment like remunerative prices, supply of inputs and infrastructure support, etc. The state agriculture research and technology initiatives, therefore, should ensure that technological research is a prime mover of change and that wherever the technological frontiers need to be transcended and new technologies created, they are done, and in a time bound manner.

11.6 The important steps needed to be initiated to revitalise the agriculture

research shall have broadly the following elements:

- The future of farming in the state will depend on the ability to increase productivity per unit of arable land and water without associated ecological harm. It requires research revolution in new plant varieties- food grains, pulses, oil seeds, vegetable, horticulture, spices and new crops from indigenous crop biodiversity. New crop research that can enhance both farm productivity and economic sustainability of farmers will, therefore, be given appropriate immediate focus.
- Agriculture research, education and extension systems will be revitalized for enhancing mountain farmers' capabilities for sustainable livelihoods, and providing for new livelihood opportunities.
- Greater congruence between productivity, sustainability and equity and creation of enabling mechanisms and inclusiveness for generation and adoption of new technologies will be the new discourse in SAUs and the research institutions. Cost effectiveness of production, quality and safety of food and other products and over all agricultural bio-security will be given high significance.
- A change from training and visit system of extension approach to a participatory i.e. effective research-extension-farmer-market-consumer interface approach of technology generation, assessment, refinement and transfer would be ushered in.
- Integration of molecular biology, bio technology, bioinformatics, nanotechnology and other cutting edge technologies with conventional as well as traditional technologies would be effected for speedy and wholesome gains.

11.7 The future priorities in the research shall have to be set in the following ways:

- Agriculture scientific community will need to state the performance of new varieties and technologies in terms of net income per hectare and not just yield per hectare.
- The research shall be undertaken in "a mode of production- processing-marketing-consumption continuum" with each link in the chain receiving timely and adequate research and

technological attention and each link being well synergized with each other.

- The technology should lead to higher productivity across all farms in J&K, climatic regimes, farming cultures and agro-ecological regimes and positively impact the seasonal and annual stability of production, especially high risk prone cold dry mountain region of the state, suffering from high instability.
- The technology should preserve the energy balance, ecosystem and the sustainability of farming in the state and create sustainable solutions for effective risk management and management and prevention of the diseases, such as, rice blast in Kashmir valley, of wheat stem rust in wheat growing areas and late blight in potatoes etc.
- The research has to come up with technologies that enable farmers to cope with the climate change and natural disasters (stress on crops from delayed rains, no rains, heat stress, frosting, cold wet pollination times causing pollination failure in fruit crops) etc. There will be an increasing need for research in areas of 'New contingency production systems", to cope with ever changing climatic and economic environments.
- As global warming increases, the high mountain areas will open up new opportunities as a result of the prolonged summers and it will enable mountain farmers in many ways, such as, try new crops, increase cropping intensity and move on higher and higher for farming. So, there will be continued need for new varieties of seeds, new horticulture crops, food crops, vegetable and spices and farming technologies for these new frontier crop lands of climate change.
- In future, the growth of agriculture would lie in involving small holders in high value agriculture. Therefore, it would be crucial to achieve inclusive and equitable development in the mountainous areas. In the transforming scenario of mountain agriculture in J&K, the role of farmers, who are not only producers, but also constitute the bulk of the poor consumers as customers, is paramount. as they would have to be in the vanguard of

any transformational scenario. Technological innovations, thus, must help these farmers to get a foot hold in this dynamic food chain. In order to main stream these farmers into high value agriculture and supply chain, the strategic partnership between private and public sectors may also be needed at some stage. Such an arrangement has to be devised to pool risks and resources to bring all the stakeholders together to resolve market failures. The market failures can also be remedied through technological research contributions to deliver high quality varieties suitable for cash cropping and agro enterprises.

11.8 Greening the Greys:

Areas which receive scant rainfall, such as, the Ladakh region, better known as cold and dry zone of the state, have concentration of poor and malnourished people. This highly risk prone area is characterized by low farm productivity, high natural resource degradation, limited access to farm technologies, infrastructure and markets, besides there are several other socio-economic constraints. In the interest of improving household food security and lessening socio-economic inequity, farm research and technology development for such areas shall need to be focused on the soil health of their farm lands and water availability. Seed security for crop security is imperative for isolated areas of this region. The essential part of the development and welfare strategy for several remote pockets in the two districts of Ladakh i.e. Leh and Kargil involve adopting seed banks, gene banks, fodder banks, food banks and water banks approaches for ensuring livelihood security to the people.

11.9 The benefits and risks of new technologies shall be carefully studied before these are recommended to the farming communities. In order to ensure social inclusion in the new technologies,

public investment in socially relevant agricultural research being undertaken by the state agricultural universities shall be stepped up. Climate change is beginning to impact the agricultural environment and mountain farmers are also beginning to experience the impact of global warming on their local farming systems, cropping patterns, grass lands and pastures and animal diseases. Protecting the livelihood security of mountain farmers from adverse climatic events and capturing new opportunities of farming shall be made a priority in the research agenda of SKUAST-K and SKUAST-J and other research institutions. In climate change sensitive areas, new approach of local partnership with local farmers shall be tried, where by local farm men and women can be designated as 'Climate managers', who lead the local folk in observing changes and innovating mitigation strategies in partnership with scientists on their farms.

11.10 In many areas, farmers have been using almost the same varieties and techniques for more than a decade now. Technology generation in our state like in other parts of the country is largely under public domain. Public sector technology generation consists of a supply driven process of putting technologies on the shelf of scientists without adequate regard to farmers' needs and perceptions. This has led to a significant gap between the varieties released by the public sector institutions and the incremental number of varieties actually used by the farmers. On the other hand, the private sector varieties and seeds like BT cotton, hybrids of maize, rice, sunflower, etc., are gaining popularity. This clearly indicates that the private sector is responding to the demand of the farmers much more effectively than the public system. The public sector institutions, therefore, would be persuaded to ensure that the technology generation is supply driven and sensitive to the needs of farmers.

Chapter 12

POLICY FRAMEWORK ON INVESTMENT IN AGRICULTURE

- The new technologies responsible for substantial increase in production are, by and large capital led, implying, thereby, that the growth in agricultural sector depends substantially on investment to develop infrastructure, improve quality of natural resources and create productive assets. In this context, however, investments in the hilly state like Jammu & Kashmir will have to be prioritized differently due to several mountain specificities.
- The stagnant productivity (02 tonnes/hectare) of major food crops grown in the State not only discourages investment, but also makes the farming business a sub-optimal proposition. Over 93% of holdings in the State belong to either marginal or small farmer category. The returns from small surpluses to this category do not suffice to cover even the input expenditure. Besides, the undulating topography in various geographies hinders movement of tractors and, thereby, prevents mechanization of agriculture and, in turn, investment on implements and machinery. Therefore, agricultural productivity, aimed at improving investible surpluses, will have to be improved to enhance appetite for private investments in agriculture.
- The evolution of technology, to make agriculture a sustainable livelihood option for rural masses, should not be a one-off phenomenon/event but a continued process together with its prompt dissemination. Accordingly, the need for strategic allocation of adequate resources for research will be an overriding focus going forward.
- Investments are required to harness the potential technological gains for improving the irrigation infrastructure to tap the potential of HYVs for high production and productivity. Investments in soil, water conservation and irrigation will not only help to improve agricultural productivity but also generate employment on long term basis.
- More than half of the gross cropped area is rainfed. Developments in dry land farming are absolutely imperative to sustain the production system. Since the State agriculture is diversifying towards high value crops like fruits and vegetables, substantial investments would be required in horticulture sector for capacity building, post-harvest infrastructure and human resource development.
- Despite significant progress made in terms of spread, network and outreach of credit delivery, the quantum of flow of financial resources to the agriculture and allied sectors continues to be inadequate. The flow of investment credit to various sectors of agriculture is constrained by the host of factors such as, high transactional costs, structural deficiencies in the rural credit delivery system, issues relating to credit worthiness and lack of collaterals in view of low asset base of farmers. In order to enhance the credit flow to small and marginal farmers, it is necessary to develop new innovations in product design and methods of delivery, explore SHG-Bank linkage model to leverage both the community based structures and existing banking institutions, and enhance the outreach of Kisan Credit Cards to cover all eligible farmers. It is imperative that credit flow should inevitably be complimented by credit advisory/counselling services. More and more institutional involvement in the sphere of credit delivery to agriculture and allied sectors shall be secured through specific measures like, enhancing the credit exposure limits of the banks to the level of national benchmarks and by creating a user friendly environment between financial institutions and farmers.

- Ministry of Agriculture, Government of India, has already launched many centrally sponsored schemes for improving quality of life of farmers, especially small and marginal farmers, by offering complete package of activities under various schemes to maximize returns for enhancing the food and livelihood security of the farmers. While these schemes address most of the requirements of development interventions, but the constraints of dwindling water resources, hilly terrain, fragile topography etc., has whittled down rate of recovery in terms of production and productivity. All efforts shall be made to bridge the gap between the production potential of various improved crop varieties and the production realized by the farmers in the fields by seeking appropriate concessional regimes and development modules from the Ministry of Agriculture, Government of India, while harnessing maximum benefits out of the available schemes.
- To supplement the efforts being made under various centrally sponsored schemes, the Government shall consider injection of resources by the State also to make agriculture a meaningful activity based on the duly assessed needs of various areas. While doing this, the interests of small and vulnerable farmers shall be especially secured.
- The national level financial institutions, particularly 'NABARD' have not been able to infuse credit into the agriculture and allied sectors to the desired level so far, as they have not been able to achieve appropriate outreach to the farming community and in the process upscale the limits of investment in these sectors. These financial institutions shall have to improve their footprints in all the regions/areas of the State. The State Government shall proactively pursue with these institutions to achieve this objective.

Chapter 13

POLICY FRAMEWORK ON LADAKH SPECIFIC INTERVENTIONS

Ladakh, the cold arid region of the state, is spread over an area of 59100 square kilometres. The cultivated area is less than 1% of its geographical expanse. Climatically, the region is characterized by severe, prolonged winter and mild summer in major parts of the region, which facilitates only mono-cropping. Over an extremely limited area, winters are comparatively mild, and summers are long, which enables the execution of double cropping. The region receives very limited precipitation (80-140 cm) annually. There is high evaporation and occurrence of percolation losses and porosity of soil respectively, which not only limits irrigated cultivation, but also extensive cultivation. Owing to the peculiar agro-climatic conditions, the region is endowed with many important animal and plant species like black neck crane, double humped camel, Russian olive, sea buck thorn and vast varieties of apricot. There is an immediate need to conserve this unique flora and fauna, and preserve and promote their germplasm, besides efficiently using water and other resources for both vertical and horizontal expansion of agriculture. The policy focus in Ladakh region seeks to take the following specific initiatives:-

13.1 Lifting of ban on export of fresh fruits:

The ban on export of fresh fruits (apricot) from Ladakh region was imposed decades ago. A control cum research programme presently being carried out by the SKUAST-Kashmir for the last two years, has reported that larvae emerge from fruits by the end of August and go for hibernation under tree barks or soil cracks. The preliminary observations reveal that after destroying the larvae, both infested and healthy fruit do not record any pest carrier (egg, larvae or pupae) beyond the end of August. For further safety, the diffusion of pest can be prevented by setting up a phyto sanitary unit (applying X-ray) at the junction of fruit growing areas (Chanigund-Kargil and Upshi-Leh) or by permitting export of fresh fruit only in tropical and sub-tropical zones (where the host of the codling moth does not exist) and authorizing opening of the fresh fruit loaded vehicles only in the permitted zones. Policy will be pursued to address these issues and help lift the ban on export of fresh apricots from Ladakh.

13.2 Cold Storage:

In order to get a reasonable price for the farm produce and for ensuring availability of fresh fruits and vegetables round the year, construction of controlled atmospheric storage capacities across the entire region or ordinary storage capacities in cold ice pockets will be promoted.

13.3 Upgradation of Agriculture Research Sub-Station, Kargil, to Regional Horticulture Station, Kargil, is necessary in what is the niche horticulture zone in the entire Northern zone and also place of origin for best quality apricot cultivars 'Halman' (both for table and drying) and the sweetest and attractive coloured apple cultivar 'Karkitchhoo'. The above region is endowed with vast varieties of wild roses and minor flowers. The policy shall aim to preserve and promote the biodiversity along with optimally using the resources of the region for ecologically sustainable and economically desirable gains in the agriculture and allied sectors.

13.4 In view of the prolonged winter, preservation and value addition of various crops for subsequent use is a big challenge. While locally produced vegetables do not fetch good price in late autumn due to glut in the market, in winter, on the other hand, they are scarce and become available at the highest possible price. The region is rich in a number of valuable plant species like sea buck thorn, Russian olive, wild black current, rhubarb, wild leek, wild garlic and vast varieties of wild apricot etc,. These species have capability to grow well under extreme climatic conditions and the derivatives of these plants have great economic value and, therefore, their cultivation can bring substantial economic gains for the region. By-products derived from these plants have several uses like heating and charcoal production from apricot stone shell; poultry/cattle feed from oil cake etc,. Steps would be initiated to tap this potential.

13.5 Establishment of forest plant gene bank:

A large area of the region experiences cold weather and good precipitation. Therefore, the introduction of new species, suited to the local conditions, in these

areas shall be carried out so as to make these areas productive. The willow plantation in Zanskar is an example of such a local climate friendly introduction.

13.6 Up gradation of Seed Farms:

Quality seed production of various cold resistant crops can easily become the region's USP in view of the enabling climate. Therefore, efforts will be made to upgrade and set up seed farms across the region for production of quality seeds.

13.7 Extensive/Intensive Cultivation:

As per records, out of 59100 Sq km geographical area, less than 1% is under cultivation due to certain abiotic stresses, namely, water, high desiccating winds and connectivity. Necessary remedial measures for conservation and efficient use of water shall be taken. The transportation of farm produce to the markets shall be facilitated by developing IT enabled market linkages. Besides, the technology for growing trees in hillocks, which require less moisture, shall be encouraged.

13.8 Establishment of Processing Units for value addition:

Since the region has the potential to produce various high value crops like apricot, sea buck thorn, black current, rhubarb, Russian Olive, fox tail millet, buck wheat and barley and these crops serve as important ingredients for different types of confectioneries and tonics, the value addition link in the complex value chain in respect of this region shall be strengthened by setting up adequate processing units.

13.9 Commercialization of Poly Green House:

Ladakh, being the high mountain inhabited area has great potential for trapping solar energies, therefore, construction of green houses based on Chinese technology will be promoted to enhance the production of off-season vegetables. The provision of subsidies for the purpose shall also be suitably explored.

13.10 Provision for refrigerated Vans:

In order to facilitate transportation of perishable fruits, vegetables and flowers to the 'mandis', the usage of refrigerated vans during summers shall be promoted and, wherever necessary, financial handholding for the purpose shall also be considered to be arranged.

13.11 *In situ* conservation of germplasm:

Ladakh region is endowed with a number

of precious germplasm and most of it is location specific. This wide diversity demands timely cataloguing and conservation of flora and fauna. These gene pools need to be conserved before they are irreversibly lost. The Government will take steps in consultation with the SKUAST-Kashmir to appropriately conserve the flora and fauna of the region by setting up gene banks etc.,

13.12 Strengthening of Animal Clinics/Laboratories:

Crop husbandry and animal husbandry are interdependent enterprises, which compliment and supplement each other and help guarantee livelihood security in the cold arid region. With the inflow of large number of ruminants on account of demand of meat, there is a natural influx of related diseases as well. To check large scale incidence of diseases and keep the livestock in good health, the necessary physical infrastructure, in the form of quality vet clinics/labs, and human resource capital shall be arranged.

13.13 Reinforcement of pasture land:

Pastures are the mainstay of the livestock in the region, where stall feeding is needed for a large part of the year. A good part of fodder for stall feeding is collected from pasture areas beyond the farm land and made into hay. This supports the large animal population of the region. It is important not only for ensuring sustainable agriculture, but also for livelihood security. Uncontrolled grazing has led to degradation of pastures and shrinkage, especially, those close to human dwellings. Efforts will be made to revitalize these pastures through scientific interventions, and this policy shall seek to put in place a proper strategy in this regard.

13.14 Provision for mobile soil clinics:

In this vast region, the chemical and physical properties of soil, across different areas, are significantly different. This poses a challenge to the scientists and the practitioners of the profession to understand the nature of soils before agriculture is taken to such areas. This, in turn, requires appropriate platform for scientifically evaluating the nature of these soils. Thus, availability of mobile soil laboratories along with trained human resource shall be given high priority.

13.15 Enhancing meat production:

The meat consumption of the region is estimated at 10000 MTs per year. This unprecedented high demand is also owing

to the floating population in the region in the form of tourists, defence personnel and labour force. There is a substantial need of protein intake in this region for survival. Against this demand, the local production is very low. In order to address this demand, greater emphasis shall be laid upon increasing the levels of the in-house production of all important ingredients of human diet including introduction of adoptable breeds of sheep/goat, revitalizing backyard poultry, encouraging commercial poultry and exploring introduction of rabbitry and breeding local cattle/yak with the semen of wild yak (Dong). Possibilities will be explored to introduce yak for breeding purposes from China, Mongolia etc.

13.16 Enhancing *pashmina* wool production:

Introduction of *pashmina* goat in non-traditional areas is reportedly paying good dividends. The introduction of relevant combing tools is expected to help full exploitation of the inherent potential. Such an intervention can guarantee livelihood security for the marginal farmers, as its nutritional and accommodation requirements economically afford better option than any other traditional breed.

13.17 Improvement in milk production: Local breeds are small bodied and well adapted to the scarce fodder availability in

the region. Accordingly, their milk producing capacity is also low. In order to meet the milk demand, four- pronged approach shall be considered for adoption;

- Genetically improving the local breeds through crossing with quality breeds.
- Introduction and commercialization of milching goat like Sarohai and Jakaria.
- Incorporation of locally available materials in the feed.
- Increasing fodder production through various interventions, such as, quality seed supply, production of fodder as second crop in non traditional areas etc.

13.18 Provision for mobile animal clinics: Reluctance on the part of the animal keepers in far-off villages, coupled with poor accessibility, mostly cause death of these animals before they could be brought under the animal care in the clinics. This will have to be remedied by timely diagnosis, effective animal care management by training local villagers in basic animal care and addressing cultural and mindset issues. The policy interventions in this direction, inter-alia, envisage setting up of mobile units to deal with animal care issues in the region.

Chapter-14

THE NEED FOR A PARADIGM SHIFT FOR SUSTAINABLE GROWTH

- Agriculture has, after a very long time, occupied the centre stage in the economic and administrative discourse in the State at a time when all seemed lost due to the dwindling interest of the younger generation in the agriculture activities. The concerted efforts of the Agriculture Production Department have triggered a new hope among the people, which promises profitability and dignity in the agriculture as an occupation.
- In the changed scenario, the survival of agriculture as a viable activity shall primarily depend upon the ability of the department to adequately address the downsides of shrinking crop lands, water scarcity, technological fatigue, institutional support, opportunities for marketing etc. The nature and scale of resource endowments, diversity in environment and complex socio-economic setting of the people would be the important dots to connect in drawing a holistic picture of sustainable and inclusive agriculture growth in the sector.
- Diversification of agriculture in the State is the need of hour. The natural endowments of the State may have constrained growth in the conventional agriculture, but their effective leveraging can help the State to script a spectacularly transformational story in the diversified agriculture. The State's long standing weakness can easily become its USP. The switch to low volume high value segment of agriculture can deliver both improved incomes and better options for the stakeholders. Therefore, efforts shall be made to identify different linkages and develop the comparative advantages that agriculture in these diversified areas has to offer. Strategies will be developed to bring about paradigm shift in thinking from mere productivity enhancement of crops and commodities to job led agricultural growth. Some of the areas that need special focus would include:
 - Promoting cultivation of 'basmati' rice and converting the *Basmati* growing areas in Jammu into a special economic zone.
 - Doubling the production of saffron in Kashmir in next four years and harnessing the benefits of this important cash crop in non-traditional areas.
 - Harnessing local bio-diversity to increase income opportunities and develop resilience against the emerging climate change challenges.
 - Promoting value addition in horticulture produce as well agri-produce (wherever surpluses are available) to add value and generate considerable employment and income generation opportunities.
 - Experience shows organic farming reduces health hazards and in time reduces dependence upon higher level of inputs. There are also reports that the organic produce commands premium prices in the market. Accordingly, efforts shall be made to encourage farmers to adopt organic farming.
 - The switch over to high value agriculture has to be demand led and very closely coordinated between input suppliers, farmers (especially small holders by clustering them into groups), logistics players (including cold storage and warehouses), large scale modern processors and organized retails in an integrated value chain of the modern agri-system. The major players driving this chain will have to come from the private sector.
 - Up until now, the policy approach has been to secure the increase in production by price support mechanisms or handing out subsidies on agricultural inputs. This approach needs to be changed, if the optimal growth in the high value agriculture has to be achieved and sustained. There would have to be an increased emphasis on investments in key areas in the sector together with a well rounded institutional development and to secure higher level of production and productivity. The policy will

develop key approaches towards the development of high value agriculture based on careful assessment of constraints and the available resource envelope and options. Its implementation shall

put the State on a high growth trajectory in agriculture and offer higher incomes to the stakeholders.

